

PUBLICATIONS
OF THE
AMERICAN
ECONOMIC ASSOCIATION

THIRD SERIES, VOLUME V

1904

PUBLISHED FOR THE
AMERICAN ECONOMIC ASSOCIATION
BY THE MACMILLAN COMPANY
NEW YORK
LONDON: SWAN SONNENSCHN & CO.
1904



CONTENTS OF VOLUME FIVE, THIRD SERIES.

	PAGES
NUMBER 1.—PAPERS AND PROCEEDINGS OF THE SIXTEENTH	
ANNUAL MEETING. PART I.	I—244
Introduction	1
Constitution	3
By-Laws	5
Officers	7
Council	8
List of Members	12
Council Meeting	41
Presidential Address, Edwin R. A. Seligman	49
Sugar. William C. Stubbs	79
Rice. S. A. Knapp	102
Cotton and General Agricultural Outlook. D. F. Houston ..	113
Tobacco. Lawson H. Shelfer	129
The Cotton Industry. D. A. Tompkins	144
The Utilization of Southern Wastes. Richard H. Edmonds ..	162
The Relations between Rent and Interest. Frank A. Fetter ..	176
Index	241
NUMBER 2.—PAPERS AND PROCEEDINGS OF THE SIXTEENTH	
ANNUAL MEETING. PART II.	245- 448
The Management of the Surplus Reserve. Edward S. Meade ..	245
The Theory of Loan Credit in Relation to Corporation Eco- nomics. J. Pease Norton	280
State Taxation of Interstate Commerce. Frank J. Goodnow ..	307
Trusts. Henry C. Adams	335
A Theory of Social Causation. Franklin H. Giddings	383
Index	445
NUMBER 3.—MONOPOLISTIC COMBINATIONS IN THE GERMAN	
COAL INDUSTRY. Francis Walker	449- 790
Contents	v
Introduction	457
Part I: General Aspects of the Coal Industry	461
Part II: History of Coal Combinations	494
Part III: Internal Organization and Policy of the Coal and Coke Cartells	534

Part IV : Analysis of the Operation of the Coal and Coke Cartels	577
Part V : Regulation and Reform	760
Bibliographical References	784
NUMBER 4.—THE INFLUENCE OF FARM MACHINERY ON PRO-	
DUCTION AND LABOR. H. W. Quaintance.....	791- 904
Contents	v
Part I : Historical Survey	799
Part II : Machinery and Production	810
Part III : Machinery and Labor	827
Appended Tables	891

GENERAL LIBRARY
UNIV. OF MICH.
MAY 4 1904

PUBLICATIONS
OF THE
AMERICAN ECONOMIC ASSOCIATION

THIRD SERIES
VOL. V, No. 1.

ISSUED QUARTERLY.
PRICE, \$4.00 PER YEAR.

PAPERS AND PROCEEDINGS

OF THE

SIXTEENTH ANNUAL MEETING

PART I

NEW ORLEANS, LA.

DECEMBER 29-31, 1903

FEBRUARY, 1904

PUBLISHED FOR THE
AMERICAN ECONOMIC ASSOCIATION
BY THE MACMILLAN COMPANY
NEW YORK

LONDON: SWAN SONNENSCHEIN & CO.

Entered as Second Class Matter at the New York, N. Y., Post Office May 23, 1900

PRICE, IN PAPER, \$4.00

AMERICAN ECONOMIC ASSOCIATION

Organized at Saratoga, September 9, 1885

EX-PRESIDENTS

- | | |
|---|---|
| *FRANCIS A. WALKER,
Massachusetts Inst. of Technology. | HENRY C. ADAMS,
University of Michigan. |
| *CHARLES F. DUNBAR,
Harvard University. | ARTHUR T. HADLEY,
Yale University. |
| JOHN B. CLARK,
Columbia University. | RICHARD T. ELY,
University of Wisconsin. |
| EDWIN R. A. SELIGMAN,
Columbia University. | |

OFFICERS FOR THE YEAR 1904

President.

FRANK W. TAUSSIG,
Harvard University.

Vice-Presidents.

IRVING FISHER,
Yale University.

JOHN H. GRAY,
Northwestern University.

JOHN GRAHAM BROOKS,
Cambridge, Mass.

Secretary and Treasurer.

FRANK A. FETTER,
Cornell University, Ithaca, N. Y.

Publication Committee.

JACOB H. HOLLANDER, Chairman,
Johns Hopkins University, Baltimore, Md.

THOMAS N. CARVER,
Harvard University.

DAVIS R. DWNEY,
Massachusetts Inst. of Technology.

DAVID KINLEY,
University of Illinois.

WILLIAM A. SCOTT,
University of Wisconsin.

HENRY R. SHAGER,
Columbia University.

Executive Committee.

Ex-Officio Members—

THE PRESIDENT

THE SECRETARY-TREASURER

THE CHAIRMAN PUBL. COM.

Elected Members—

WINTHROP M. DANIELS,
Princeton University.

HENRY B. GARDNER,
Brown University.

WILLIAM Z. RIPLEY,
Harvard University.

Inquiries and other communications regarding membership, subscriptions meetings, and the general affairs of the Association should be addressed to the Secretary of the American Economic Association, Cornell University, Ithaca, N. Y. Orders for publications should be addressed to The Macmillan Co., 66 Fifth Avenue, New York.

* Deceased.





PUBLICATIONS
OF THE
AMERICAN ECONOMIC ASSOCIATION

THIRD SERIES.
VOL. V, No. 1.

ISSUED QUARTERLY.
PRICE, \$4.00 PER YEAR.

PAPERS AND PROCEEDINGS

OF THE
SIXTEENTH ANNUAL MEETING

PART I

NEW ORLEANS, LA.

DECEMBER 29-31, 1903

FEBRUARY, 1904

PUBLISHED FOR THE
AMERICAN ECONOMIC ASSOCIATION
BY THE MACMILLAN COMPANY
NEW YORK
LONDON: SWAN SONNENSCHN & CO.

Copyright, 1904, by
AMERICAN ECONOMIC ASSOCIATION

PRESS OF
ANDRUS & CHURCH
ITHACA, N. Y.

EDITORIAL NOTE.

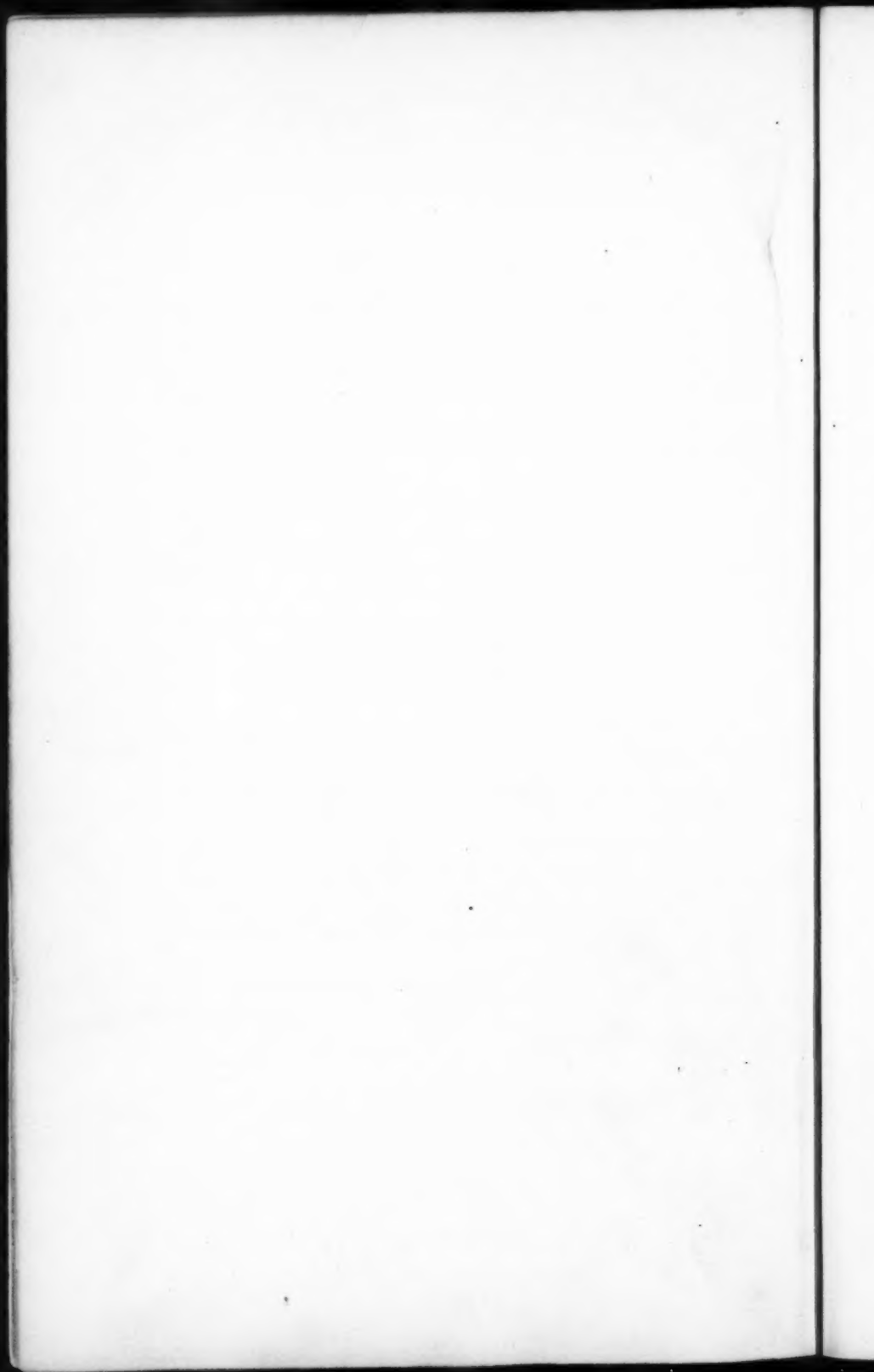
As the program at the meeting in New Orleans was unusually full, the Publication Committee directed that the Proceedings be published this year in two parts. The delay in the issue of the first part has been caused by the failure to secure the promised stenographic report of the discussions. The kind coöperation of the speakers has, at the cost of time and effort to all concerned, made good a large part of the loss. Some of the discussions, however, it has been impossible to recall after the lapse of so long a time; and other discussions could be reproduced only in a much abridged form. These lacks are much to be regretted, yet taken together the two parts of this year's "Papers and Proceedings" will, it is believed, equal the former reports in quality, and considerably exceed them in quantity.

The group of papers and discussions on Southern questions, and the group on rent and interest, have been issued as separate reprints at the price of fifty cents each.

It is expected that Part II will be issued before the end of the month of May, in which it is dated. It will contain the papers and discussions of the sessions on State and Corporate Finance, The Trust Problem, and Sociology and History.

FRANK A. FETTER,
Secretary.

March 28, 1904.



CONTENTS—PART I

	PAGE
THE AMERICAN ECONOMIC ASSOCIATION :	
Introduction	1
Constitution	3
By-laws	5
Officers for the Year 1904	7
Council	8
List of Members	12
Summary of Membership	37
THE SIXTEENTH ANNUAL MEETING OF THE ASSOCIATION :	
Program	38
Council Meetings	41
Report of the Secretary	41
Report of the Treasurer	44
Resolutions	47
PAPERS AND DISCUSSIONS :	
Social Aspects of Economic Law. Presidential address by Edwin R. A. Seligman	49
Address of Welcome. By Edwin A. Alderman	74
Sugar. By William C. Stubbs	79
Discussion : John Dymond	99
Rice. By S. A. Knapp	102
Discussion : S. Locke Breaux	110
Cotton and the General Agricultural Outlook. By D. F. Houston	113
Discussion : Geo. K. Holmes, W. C. Stubbs	122
Tobacco. By Lawson H. Shelfer	129
Discussion : J. B. Killebrew, W. H. Glasson	135
The Cotton Industry. By D. A. Tompkins	144
Discussion : C. C. Thach	154
The Utilization of Southern Wastes. By Richard H. Edmonds	162

The Relations between Rent and Interest. By Frank A. Fetter	176
Discussion : Thomas N. Carver	199
Jacob H. Hollander	204
Charles W. MacFarlane	209
Lindley M. Keasbey	216
W. G. Langworthy Taylor	218
Richard T. Ely	221
James E. Le Rossignol	224
Franklin H. Giddings	225
Winthrop M. Daniels	226
Frank A. Fetter	227
INDEX	241

AMERICAN ECONOMIC ASSOCIATION

The American Economic Association is an organization composed mainly of persons interested in the study of political economy or the economic phases of political and social questions. As may be seen by examining the list of members and subscribers printed in this volume, not only are all universities and most prominent colleges in the country represented in the Association by their teachers of political economy and related subjects, but even a larger number of members come from those interested as business men, journalists, lawyers or politicians in the theories of political economy or, more often, in their applications to social life. There are further more than one hundred subscribers, nearly all being large libraries.

The first two meetings of the Economic Association in 1885 and 1887, and the meetings of 1897, 1898, 1900, 1901, 1902 and 1903, were at the same place as those of the American Historical Association. Joint sessions and less formal gatherings of the members of the two Associations were thus held. The annual meetings give opportunity for social intercourse among the teachers and public men composing the Association's membership. They contribute also to create and cement acquaintanceship and friendship between teachers of economics and cognate subjects in different institutions, and so to counteract any tendency to particularism which the geographical separation and the diverse traditions of American colleges might be deemed to foster.

The Publications of the Association, a complete list

of which is printed at the end of this volume, were begun in March, 1886. The first series of eleven volumes was completed by a general index in 1897. The second series, comprising two volumes, was published in 1897-99, and in addition thereto the Association issued, during 1896-99, four volumes of Economic Studies. In 1900, a third series of quarterly Publications was begun with the Papers and Proceedings of the Twelfth Annual Meeting, and has been continued since with ample amount and variety of matter. It is intended to add to these quarterly numbers, from time to time, such monographic supplements as the condition of the treasury and the supply of suitable manuscript may make possible.

The American Economic Association is the organ of no party, sect or institution. It has no creed. Persons of all shades of economic opinion are found among its members, and widely different views are given a hearing in its annual meetings and through its publications.

The officers of the Association and the contributors to its Publications receive no pay for their services. Its entire receipts are expended in printing and circulating the Publications and in the slight expenses attendant upon the annual meetings. Any member, therefore, may regard his annual dues either as a subscription to an economic publication, a payment for membership in a scientific association, or a contribution to a publication fund for aiding the publication of valuable manuscript that might not be accepted by a publishing house governed primarily by motives of profit, and that could not be published by the writer without incurring too heavy a burden of expense.

CONSTITUTION

ARTICLE I.

NAME.

This Society shall be known as the AMERICAN ECONOMIC ASSOCIATION.

ARTICLE II.

OBJECTS.

1. The encouragement of economic research, especially the historical and statistical study of the actual conditions of industrial life.
2. The publication of economic monographs.
3. The encouragement of perfect freedom of economic discussion. The Association as such, will take no partisan attitude, nor will it commit its members to any position on practical economic questions.
4. The establishment of a bureau of information designed to aid members in their economic studies.

ARTICLE III.

MEMBERSHIP.

Any person may become a member of this Association by paying three dollars, and after the first year may continue a member by paying an annual fee of three dollars. On payment of fifty dollars any person may become a life member, exempt from annual dues.¹

ARTICLE IV.

HONORARY MEMBERS.

The Council may elect foreign economists of distinction not exceeding twenty-five in number, honorary members of the Association. Each honorary member shall be entitled to receive all reports and publications of the Association.

¹NOTE—Each member receives all reports and publications of the Association.

ARTICLE V.

OFFICERS.

The officers of the society shall consist of a President, three Vice-Presidents, a Secretary, a Treasurer, a Publication Committee, and a Council.

ARTICLE VI.

COUNCIL.

1. The Council shall consist of an indefinite number of members of the society, chosen, with the exception of the original members, for three years. It shall have power to fill all vacancies in its membership, and may add to its number.

2. It shall elect the President, Vice-Presidents, Secretary, and Treasurer; the President, the Secretary, the Treasurer, the Chairman of the Publication Committee, and the ex-Presidents, together with three other members to be elected by the Council, shall constitute an Executive Committee with such powers as the Council may entrust to it; provided, that a quorum shall consist of four of the seven elected officers; and provided further that the offices of Secretary and of Treasurer may be filled by one person, and that the offices of Vice-President and of elected member of the Executive Committee may be filled by one person.

3. The Council shall organize itself into a number of standing committees upon the various lines of research undertaken. These committees shall prepare reports from time to time upon such subjects relating to their respective departments as they may select, or as may be referred to them by the Council. These reports shall be presented to the Council at its regular or special meetings and be open to discussion. All papers offered to

the society shall be referred to the appropriate committees before being read in Council.

4. The Council shall have charge of the general interests of the society, and shall have power to call meetings and determine what reports, papers, or discussions are to be printed, and may adopt any rules or regulations for the conduct of its business not inconsistent with this constitution.

5. The Council shall elect a Committee on Publications, which shall consist of six members, so classed that after the first election the term of two members shall expire each year. This committee shall have charge of and responsibility for the scientific publications of the Association.

ARTICLE VII.

AMENDMENTS.

Amendments, after having been approved by a majority of the Council, may be adopted by a majority vote of the members present at any regular meeting of the Association.

BY-LAWS.

1. The President of the Association, who shall be *ex-officio* a member of the council, shall preside at all meetings of the Council and Association, and perform such other duties as may be assigned to him by the Council. In case of inability to perform his duties, they shall devolve upon the Vice-Presidents in the order of their election, upon the Secretary and Treasurer, and upon the Chairmen of the Standing Committees, in the order in which the committees are mentioned in the list.

2. The Secretary shall keep the records of the Association, and perform such other duties as the Council may assign to him.

3. The Treasurer shall receive and have the custody of the funds of the Association, subject to the rules of the Council.

4. The following Standing Committees shall be organized :

- (1) On Labor.
- (2) On Transportation.
- (3) On Trade.
- (4) On Public Finance.
- (5) On Industrial and Technical Education.
- (6) On Exchange.
- (7) On General Questions of Economic Theory.
- (8) On Statistics.
- (9) On Teaching Political Economy.

The Executive Committee may appoint such special committees as it may deem best.

5. At any meeting called by the general summons of the President five members shall constitute a quorum.

6. Papers offered for the consideration of the Council, shall be referred by the Secretary, each to its appropriate committee.

7. In order to encourage economic research, the Association proposes to render pecuniary assistance in the prosecution of the same, and to offer prizes for the best monographs upon selected topics. It stands ready to accept and administer any fund placed at its disposal for either purpose.

8. The Executive Committee shall have power at any time to add new members to the Council.

9. The Executive Committee shall assign all members of the Council to one of the Standing Committees, and shall appoint the Chairmen of the Committees.

10. It shall be the duty of the Chairmen of the respective Committees to organize and direct the work of the same, under the general control of the Council.

EX-PRESIDENTS

- | | |
|---|---|
| *FRANCIS A. WALKER,
Massachusetts Inst. of Technology. | HENRY C. ADAMS,
University of Michigan. |
| *CHARLES F. DUNBAR,
Harvard University. | ARTHUR T. HADLEY,
Yale University. |
| JOHN B. CLARK,
Columbia University. | RICHARD T. ELY,
University of Wisconsin. |
| EDWIN R. A. SELIGMAN,
Columbia University. | |

OFFICERS FOR THE YEAR 1904

President.

FRANK W. TAUSSIG,
Harvard University.

Vice-Presidents.

IRVING FISHER,
Yale University.

JOHN W. GRAY,
Northwestern University.

JOHN GRAHAM BROOKS,
Cambridge, Mass.

Secretary and Treasurer.

FRANK A. FETTER,
Cornell University, Ithaca, N. Y.

Publication Committee.

JACOB H. HOLLANDER, Chairman,
Johns Hopkins University, Baltimore, Md.
THOMAS N. CARVER,
Harvard University.
DAVIS R. DEWEY,
Massachusetts Inst. of Technology.

DAVID KINLEY,
University of Illinois.
WILLIAM A. SCOTT,
University of Wisconsin.
HENRY R. SEAGER,
Columbia University.

Executive Committee.

Ex-Officio Members—

THE PRESIDENT
THE SECRETARY-TREASURER
THE CHAIRMAN PUBL. COM.

Elected Members—

WINTHROP M. DANIELS,
Princeton University.
HENRY B. GARDNER,
Brown University.
WILLIAM Z. RIPLEY,
Harvard University.

* Deceased.

COUNCIL

Term of office expiring in 1905.

FOY SPENCER BALDWIN, Boston University.
DON C. BARRETT, Haverford College.
CHARLES BEARDSLEY, Harvard University.
WILLIAM F. BLACKMAN, Rollins College.
JOHN GRAHAM BROOKS, Cambridge, Mass.
WILLIAM M. BURKE, Albion College.
ROBERT C. CHAPIN, Beloit College.
WALTER E. CLARK, New York City.
FREDERIC R. CLOW, Oshkosh Normal College.
JAMES W. CROOK, Amherst College.
JOHN F. CROWELL, Bureau of Statistics, Treasury Department.
EDWARD T. DEVINE, Charity Organization Society, N. Y.
RICHARD T. ELY, University of Wisconsin.
ROLAND P. FALKNER, Library of Congress.
HENRY W. FARNAM, Yale University.
HENRY FERGUSON, Trinity College.
IRVING FISHER, Yale University.
GEORGE M. FISK, University of Illinois.
WORTHINGTON C. FORD, Library of Congress.
HAMLINE H. FREER, Cornell College.
HENRY B. GARDNER, Brown University.
GEORGE P. GARRISON, University of Texas.
FRANKLIN H. GIDDINGS, Columbia University.
NICHOLAS P. GILMAN, Meadville, Pa.
WILLIAM H. GLASSON, Trinity College.
FRANK J. GOODNOW, Columbia University.
ELGIN R. L. GOULD, New York City.
FREDERICK C. HICKS, University of Cincinnati.
JACOB H. HOLLANDER, Johns Hopkins University.
EDMUND J. JAMES, Northwestern University.
EMORY R. JOHNSON, University of Pennsylvania.
EDWARD D. JONES, University of Michigan.
LINDLEY M. KEASBEY, Bryn Mawr College.
GUSTAV A. KLEENE, Swarthmore College.
ISIDOR LOEB, University of Missouri.
FRANK L. McVEY, University of Minnesota.
JESSE MACY, Iowa College.
MILO R. MALTBY, Art Commission of New York City.
BALTHASAR H. MEYER, University of Wisconsin.
HERBERT E. MILLS, Vassar College.

THOMAS W. PAGE, University of Texas.
WILLIAM Z. RIPLEY, Harvard University.
BENJAMIN H. RIPTON, Union College.
ALBERT SHAW, Review of Reviews.
VLADIMIR SIMKHOVITCH, Columbia University.
ALBION W. SMALL, University of Chicago.
DELOS DEWOLF SMYTH, Hamilton College.
JOHN L. STEWART, Lehigh University.
ALFRED H. STONE, Greenville, Miss.
FRANK W. TAUSSIG, Harvard University.
CHARLES A. TUTTLE, Wabash College.
THOMAS K. URDAHL, Colorado College.
FRANCIS WALKER.
LESTER F. WARD, Smithsonian Institute.
ADNA F. WEBER, New York Bureau of Labor Statistics.
HORACE WHITE, New York Evening Post.
GEORGE R. WICKER, Dartmouth College.
ALLYN A. YOUNG, Adelbert College.

Term of office expiring in 1906.

LYMAN ABBOTT, The Outlook.
THOMAS S. ADAMS, University of Wisconsin.
MORTON A. ALDRICH, Tulane University.
ABRAM P. ANDREW, Harvard University.
GEORGE E. BARNETT, Johns Hopkins University.
EDWARD W. BEMIS, Cleveland, Ohio.
RICHARD B. BOWKER, New York City.
ROELIFF M. BRECKENRIDGE, West Hamilton, Ontario.
CHARLES J. BULLOCK, Harvard University.
GUY S. CALLENDER, Bowdoin College.
THOMAS N. CARVER, Harvard University.
FREDERICK A. CLEVELAND, New York City.
CHARLES A. CONANT, Morton Trust Co., New York City.
EDWARD CUMMINGS, Cambridge, Mass.
JOHN P. CUSHING, New Haven, Conn.
WINTHROP M. DANIELS, Princeton University.
DAVIS R. DEWEY, Massachusetts Institute of Technology.
FRANK H. DIXON, Dartmouth College.
E. DANA DURAND, Harvard University.
CHARLES E. EDGERTON, Washington, D. C.
CHARLES S. FAIRCHILD, New York City.
FRANK A. FETTER, Cornell University.
WILLARD C. FISHER, Wesleyan University.
A. W. FLUX, McGill University.

J. DORSEY FORREST, Butler College.
 WILLIAM W. FOLWELL, University of Minnesota.
 JOHN E. GEORGE, Northwestern University.
 JOHN M. GLENN, Baltimore, Md.
 DAVID I. GREEN, Hartford, Conn.
 JACOB L. GREEN, Hartford, Conn.
 GEORGE GUNTON, Institute of Social Economics.
 ARTHUR T. HADLEY, Yale University.
 JAMES H. HAMILTON, Syracuse University.
 MATTHEW B. HAMMOND, University of Illinois.
 HENRY R. HATFIELD, University of Chicago.
 JEREMIAH W. JENKS, Cornell University.
 GEORGE W. KNIGHT, Ohio State University.
 SAMUEL M. LINDSAY, University of Pennsylvania.
 ISAAC A. LOOS, Iowa State University.
 JAMES A. MACLEAN, University of Idaho.
 JOHN J. McNULTY, College of the City of New York.
 THEODORE MARBURG, Baltimore, Md.
 CHARLES W. MIXTER, Harvard University.
 HENRY L. MOORE, Columbia University.
 SIMON NEWCOMB, Washington, D. C.
 VICTOR ROSEWATER, Omaha Bee.
 LEO S. ROWE, University of Pennsylvania.
 FREDERICK W. SANDERS, Leipzig, Germany.
 EDWIN R. A. SELIGMAN, Columbia University.
 MARY ROBERTS SMITH, Stanford University.
 GRAHAM TAYLOR, Chicago, Ill.
 W. G. LANGWORTHY TAYLOR, University of Nebraska.
 CHARLES W. TOOKE, Syracuse University.
 EDSON N. TUCKEV, Yale University.
 D. COLLIN WELLS, Dartmouth College.
 NATHAN A. WESTON, University of Illinois.
 ROBERT H. WHITTON, New York State Library.
 STUART WOOD, Philadelphia, Pa.

Term of office expiring in 1907.

HENRY C. ADAMS, University of Michigan.
 J. H. ARNOLD, Redfield, South Dakota.
 WILLIAM B. BAILEY, Yale University.
 JAMES W. BLACK, Colby University.
 ERNEST L. BOGART, Oberlin University.
 JOHN B. CLARK, Columbia University.
 KATHARINE A. COMAN, Wellesley College.
 JOHN R. COMMONS, Civic Federation, New York.
 CHARLES H. COOLEY, University of Michigan.
 JOHN CUMMINGS, University of Chicago.

ARTHUR M. DAY, New York City.
HENRY CROSBY EMERY, Yale University.
WASHINGTON GLADDEN, Columbus, Ohio.
JOHN H. GRAY, Northwestern University.
FREDERICK B. HAWLEY, New York City.
GEORGE K. HOLMES, U. S. Department of Agriculture.
FREDERICK C. HOWE, Cleveland, Ohio.
CHARLES H. HULL, Cornell University.
JOHN HYDE, Washington, D. C.
ALVIN S. JOHNSON, Columbia University.
DAVID KINLEY, University of Illinois.
MARTIN A. KNAPP, Interstate Commerce Commission.
HENRY W. LAMB, Brookline, Mass.
JAMES E. LEROSIGNOL, University of Denver.
CHARLES W. MACFARLANE, Philadelphia, Pa.
FREDERICK W. MOORE, Vanderbilt University.
HARRY T. NEWCOMB, Wayne, Pa.
J. PEASE NORTON, New Haven, Conn.
SIMON N. PATTEN, University of Pennsylvania.
WILLIAM R. PATTERSON, Tenement House Department, N. Y.
EDWARD T. PETERS, U. S. Department of Agriculture.
CARL C. PLEHN, University of California.
JESSE E. POPE, University of Missouri.
HARRY H. POWERS, Boston, Mass.
WILLIAM A. RAWLES, Indiana University.
GEORGE E. ROBERTS, Washington, D. C.
MAURICE H. ROBINSON, University of Illinois.
EDWARD A. ROSS, University of Nebraska.
FRANK R. RUTTER, Washington, D. C.
JOHN C. SCHWAB, Yale University.
WILLIAM A. SCOTT, University of Wisconsin.
HENRY R. SEAGER, Columbia University.
ERNEST A. SMITH, Allegheny College.
OLIVER M. W. SPRAGUE, Harvard University.
WORTHY P. STERNS, Bureau of Statistics, U. S. Treasury Dept.
FRED M. TAYLOR, University of Michigan.
THORSTEIN B. VEBLÉN, University of Chicago.
G. O. VIRTUE, Winona, Minn.
C. S. WALKER, Massachusetts Agricultural College.
ULYSSES G. WEATHERLY, Indiana University.
MAX WEST, Brooklyn, N. Y.
ALBERT C. WHITAKER, Stanford University.
WALTER F. WILLCOX, Cornell University.
H. PARKER WILLIS, Washington and Lee University.
WILLIAM F. WILLOUGHBY, U. S. Department of Labor.
CARROLL D. WRIGHT, U. S. Department of Labor.
WALTER A. WYCKOFF, Princeton University.

LIST OF MEMBERS

* Life Members

† Subscribers

° Honorary Members

- ABBOTT, LYMAN, *The Outlook*, 287 Fourth Avenue, New York City.
 ABRATANI, J., 700 Park Avenue, New York City.
 ADAM, J. N., Buffalo, N. Y.
 ADAMS, BROOKS, Quincy, Mass.
 ADAMS, CHARLES FRANCIS, South Lincoln, Mass.
 ADAMS, HENRY CARTER, Prof., Univ. of Mich., Ann Arbor, Mich.
 ADAMS, THOMAS S., Ass't Prof., Univ. of Wis., Madison, Wis.
 ADAMS, WILLIAM W., 111 June Street, Fall River, Mass.
 †ADELBERT COLLEGE, Cleveland, O.
 ADRIANCE, W. F., Yale Univ., New Haven, Conn.
 AGGER, EUGENE, 523 W. 124th Street, New York City.
 AILES, MILTON E., Treasury Dept., Washington, D. C.
 †ALBION COLLEGE, Albion, Mich.
 ALDRICH, MORTON ARNOLD, Prof., Tulane Univ., New Orleans, La.
 †ALFRED UNIVERSITY READING ROOM, Alfred, N. Y.
 ALLEN, GEORGE HENRY HOWLAND, New Bedford, Mass.
 ALLEN, JOHN ROBERT, Georgetown, Texas.
 ALLEN, WALTER S., New Bedford, Mass.
 ALLEN, WILLIAM F., South Orange, N. J.
 *ALVORD, WILLIAM, 400 California Street, San Francisco, Cal.
 AMES, C. H., 110 Boylston Street, Boston, Mass.
 †AMHERST COLLEGE, Amherst, Mass.
 ANDREW, ABRAHAM PLATT, Jr., 10 Russell Hall, Cambridge, Mass.
 ANDREWS, ELISHA BENJAMIN, Chancellor of the Univ. of Neb.,
 Lincoln, Neb.
 *ARMSTRONG, H. C., Jr., Pensacola, Fla.
 ARMSTRONG, COLLIN, 25 Broad Street, New York City.
 ARNOLD, J. H., Prof., Redfield, S. D.
 ATEINSON, EDWARD, Brookline, Mass.
 AUSTIN, O. P., Bureau of Statistics, Treasury Dept., Washington, D. C.
 *AVERY, ELROY MCKENDREE, 657 Woodlands Hills Avenue, Cleve-
 land, Ohio.
 AYERS, EDWARD E., North Andover Depot, Mass.
 BACON, MARSHALL L., Tarrytown, N. Y.
 BACON, NATHANIEL T., Peace Dale, R. I.
 BAILEY, WILLIAM B., 22 Linwood Street, New Haven, Conn.
 BAKER, CHARLES WHITING, *Engineering News*, 220 Broadway, New
 York City.

- BAKER, HENRY D., Exmoor Cottage, Highland Park, Ill.
BAKER, MOSES NELSON, *Engineering News*, 220 Broadway, New York City.
BALCH, (Miss) EMILY G., Prince Street, Jamaica Plain, Mass.
BALDWIN, FOY SPENCER, Prof., Boston Univ., 12 Somerset Street, Boston, Mass.
*BALDWIN, SIMEON EBEN, 69 Church Street, New Haven, Conn.
*BALDWIN, SUMMERFIELD, 1006 Charles Street, Baltimore, Md.
*BALDWIN, WILLIAM HENRY, Jr., Pres., Long Island R. R. Co., 128 Broadway, New York City.
BANKS, E. M., 227 W. 122d Street, New York City.
BARKLEY, RICHARD W., 220 Broadway, New York City.
BARNES, WILLIAM EDDY, Editor of *Age of Steel*, St. Louis, Mo.
BARNETT, GEORGE E., Johns Hopkins Univ., Baltimore, Md.
BARNETT, DON CARLOS, Prof., Haverford, Pa.
BARROWS, CHARLES H., Springfield, Mass.
BASSETT, JOHN S., Trinity College, Durham, N. C.
BATCHELLER, (Mrs.) ALFRED H., 55 Commonwealth Avenue, Boston, Mass.
BATCHELLER, ROBERT, North Brookfield, Mass.
†BATES COLLEGE, Lewiston, Me.
BAXTER, SYLVESTER, 32 Murray Street, Malden, Mass.
BEARD, J. N., 129 Haight Street, San Francisco, Cal.
BEARDSLEY, CHARLES, 378 Harvard Street, Cambridge, Mass.
BECHER, FRANKLIN A., 406 Irving Place, Milwaukee, Wis.
BECKHARD, M., 52 William Street, New York City.
BEER, GEORGE LOUIS, 65 Pine Street, New York City.
BEER, WILLIAM, Howard Memorial Library, New Orleans, La.
BELLER, WILLIAM F., 55 E. 112th Street, New York City.
BEMIS, EDWARD WEBSTER, 178 Kensington Street, Cleveland, O.
BENNETT, J. M., The Wyandotte, Columbus, O.
BERARD, EUGENE M., 7 Nassau Street, New York City.
BERRYHILL, JAMES G., 1101 Pleasant Street, Des Moines, Ia.
BIGELOW, N. P., 308 Tacoma Building, Chicago, Ill.
BILGRAM, HUGO, corner 12th and Noble Streets, Philadelphia, Pa.
BILLQUIST, C. EDWARD, 11 Broadway, New York City.
*BIXBY, WILLIAM HERBERT, U. S. Engineer Office, Jones Building, Detroit, Mich.
BLACK, JOHN WILLIAM, Prof., Colby College, 4 Dalton Street, Waterville, Me.
BLACKMAN, WILLIAM FREEMONT, Pres., Rollins College, Winter Park, Fla.
BLACKMAR, FRANK W., Prof., Kansas State Univ., Lawrence, Kan.
BLAIR, JAMES L., Union Trust Building, St. Louis, Mo.
BLANCHARD, NATHAN W., Santa Paula, Cal.
BLETHEN, Col. A. J., *The Times*, Seattle, Wash.
BLOOD, JOHN BALCH, 10 Post Office Square, Boston, Mass.

- BOCOCK, Rev. KEMPER, 321 S. 13th Street, Philadelphia, Pa.
 BODINE, SAMUEL T., Broad and Arch Streets, Philadelphia, Pa.
 °BODIO, LUIGI, Prof., Rome, Italy.
 BOERNER, ARTHUR R., Cedarburg, Wis.
 BOGART, ERNEST LUDLOW, Prof., Oberlin, O.
 °BÖHM-BAWERK, EUGEN, Prof., III Beatrix Gasse, 14B, Vienna, Austria.
 BOISSEVAIN, G. M., 4 Tesselchade-stratt, Amsterdam, Holland.
 BOLLES, ALBERT S., Prof., Haverford College, Haverford, Pa.
 BONN, MAX, 30 Broad Street, New York City.
 BORG, SIDNEY C., 20 Nassau Street, New York City.
 †BOSTON ATHENÆUM, Beacon Street, Boston, Mass.
 †BOSTON PUBLIC LIBRARY, Boston, Mass.
 †BOWDOIN COLLEGE, Brunswick, Me.
 *BOWEN, CLARENCE WINTHROP, *The Independent*, 251 Broadway, New York City.
 BOWEN, J. CHESTER, Bureau of Labor, Washington, D. C.
 *BOWKER, RICHARD ROGERS, *Publisher's Weekly*, 31 and 32 Park Row, New York City.
 BRECKENRIDGE, ROELIFF MORTON, 216 Jackson Street, W. Hamilton, Ontario.
 BREED, W. J., 408 Pike Street, Cincinnati, O.
 BRIDGES, ROBERT, Orillia, King Co., Wash.
 BRIGHT, GEORGE W., Pres., Boomer Coal and Coke Co., Columbus, Ohio.
 BROHOUGH, G. O., Prof., Red Wing, Minn.
 BRONSON, SAMUEL L., New Haven, Conn.
 †BROOKLYN LIBRARY, Montague Street, Brooklyn, N. Y.
 BROOKS, JOHN GRAHAM, 8 Ash Street, Cambridge, Mass.
 BROOKS, ROBERT C., Instructor, Cornell Univ., Cascadilla Place, Ithaca, N. Y.
 *BROUGH, WILLIAM, New Hamburg, N. Y.
 BROWN, NELSON P., 38 Oakes Street, Everett, Mass.
 BROWN, R. L., Austin, Texas.
 BROWN, THOMAS EDWIN, 1035 Liberty Street, Franklin, Pa.
 †BROWN UNIVERSITY, Providence, R. I.
 BROWNE, G. MORGAN, 44 Pine Street, New York City.
 BRUCE, ROBERT C., Director Tuskegee Institute, Tuskegee, Ala.
 BRUMMER, LEON, 7 Pine Street, New York City.
 †BRYN MAWR COLLEGE, Bryn Mawr, Pa.
 BUCKLER, WILLIAM W. North Avenue, Baltimore, Md.
 †BUCKNELL UNIVERSITY, Lewisburg, Pa.
 †BUFFALO PUBLIC LIBRARY, Buffalo, N. Y.
 BULLOCK, CHARLES JESSE, Prof., Harvard Univ., Cambridge, Mass.
 BUNNELL, J. S., San Francisco, Cal.
 †BUREAU OF EDUCATION, Washington, D. C.

- BURGESS, JOHN WILLIAM, Prof., Columbia Univ., 323 W. 57th Street,
New York City.
- BURKE, WILLIAM MAXWELL, Albion College, Albion, Mich.
- BUTLER, HERMAN B., 18 Milwaukee Avenue, Chicago, Ill.
- †BUTTE CITY FREE PUBLIC LIBRARY, Butte City, Mont.
- BUTTERFIELD, KENYON L. Kingston, R. I.
- CALDWELL, HOWARD WALTER, Prof., Univ. of Neb, 511 N. 16th
Street, Lincoln, Neb.
- †CALIFORNIA STATE LIBRARY, Sacramento, Cal.
- †CALIFORNIA, UNIVERSITY, Berkeley, Cal.
- CALLENDER, GUY STEPHENS, 716 Divinity Hall, New Haven, Conn.
- CAMPBELL, NORMAN M., Colorado Springs, Col.
- CANADIAN DEPUTY MINISTER OF LABOR, Ottawa, Ontario, Canada.
- †CANADIAN LIBRARY OF PARLIAMENT, Ottawa, Canada.
- *CARNEGIE, ANDREW, 5 W. 51st Street, New York City.
- †CARNEGIE FREE LIBRARY, Allegheny, Pa.
- †CARNEGIE LIBRARY, Pittsburg, Pa.
- CARPENTER, GEORGE O., Russell and Compton Avenues, St. Louis,
Mo.
- CARVER, THOMAS NIXON, Prof., Harvard Univ., 16 Kirkland Road,
N. Cambridge, Mass.
- CASSOT, ARTHUR, Manager Manhattan Press Clipping Bureau, 2 W.
14th Street, New York City.
- CATOR, GEORGE, 803 St. Paul Street, Baltimore, Md.
- CATT, GEORGE W., 2407 Park Row Building, New York City.
- †CEDAR RAPIDS FREE PUBLIC LIBRARY, Cedar Rapids, Iowa.
- CHANDLER, ALFRED D., Brookline, Mass.
- CHANDLER, JAMES E., Old Orchard, Me.
- CHAPIN, ROBERT COIT, Prof., Beloit College, Beloit, Wis.
- CHASE, HARVEY S., 8 Congress Street, Boston, Mass.
- CHASE, SIMEON B., King Philip's Mills, Fall River, Mass.
- CHASNOFF, JACOB, 10 Lathrop Hall, Columbia, Mo.
- CHICAGO CITY CLUB, 180 Madison Street, Chicago, Ill.
- †CHICAGO LAW INSTITUTE, County Building, Chicago, Ill.
- †CHICAGO PUBLIC LIBRARY, Chicago, Ill.
- †CHIYOZO, OTSUKA, 24 Chiyodacho, Kanda-ku, Tokio, Japan.
- †CINCINNATI PUBLIC LIBRARY, Cincinnati, O.
- †CINCINNATI, UNIVERSITY, Cincinnati, O.
- CLAGHORN, (Miss) K. HOLLADAY, 81 Columbia Heights, Brooklyn,
N. Y.
- CLARK, Miss JEANNETTE A., Winona, Minn.
- CLARK, JOHN BATES, Prof., Columbia Univ., 616 West 113th Street,
New York City.
- *CLARK, JOHN SPENCER, Secy., Prang Educational Co., 110 Boylston
Street, Boston, Mass.
- *CLARK, MARTIN, 91 Erie Co. Bank Building, Buffalo, N. Y.
- CLARK, W. E., 75 Washington Place, New York City.

- †CLARK UNIVERSITY LIBRARY, Worcester, Mass.
CLARKE, ENOS, Kirkwood Station, St. Louis, Mo.
CLARKE, WILLIAM NEWTON, Prof., Colgate Univ., Hamilton, N. Y.
CLEVELAND, F. A., 30 Broad St., New York City.
†CLEVELAND PUBLIC LIBRARY, Cleveland, O.
CLOW, FREDERICK REDMAN, Prof., State Normal, Oshkosh, Wis.
COE, WILLIAM T., Temple Court, Minneapolis, Minn.
COHN, MORRIS M., Little Rock, Ark.
°COHN, GUSTAV, Prof., Göttingen, Germany.
COLBY, FRANK MOORE, Prof. and Editor, University Heights, New York City.
COLER, BIRD S., 280 Broadway, New York City.
COLLS, LEWIS E., Norman, Okl.
COLLIN, CHARLES AVERY, 32 Nassau Street, New York City.
†COLORADO, UNIVERSITY, Boulder, Col.
†COLUMBUS PUBLIC LIBRARY, Columbus, O.
COMAN, KATHARINE, Prof., Wellesley College, Wellesley, Mass.
COMMONS, JOHN ROGERS, 281 Fourth Ave., New York City.
CONANT, CHARLES A., Morton Trust Co., New York City.
CONANT, LEONARD H., 30 Broad Street, New York City.
CONNER, J. E., Univ. of Penn., Philadelphia, Pa.
°CONRAD, JOHANNES, Prof., Univ. of Halle, Halle a/S. Germany.
†CONSUMER'S LEAGUE, 105 E 22d Street, New York City.
*COOK, CHARLES C., 2222 6th Street, N. W., Washington, D. C.
COOK, HOWARD HAMBLETT, M D., 71 City Hall, Boston, Mass.
COOLEY, CHARLES HORTON, Prof., Univ. of Mich., Ann Arbor, Mich.
COOLEY, EDWIN GILBERT, Supt. of Schools, Schiller Building, Chicago, Ill.
COOLIDGE, THOMAS JEFFERSON, 64 Ames Building, Boston, Mass.
COOPER, A. R., Galt House, Louisville, Ky.
COWDERY, EDWARD G., Milwaukee, Wis.
CRAFTS, (Miss) LETTIE M., Asst. Librarian, Univ. of Minn., Minneapolis, Minn.
CRANE, C. R., 2559 Michigan Avenue, Chicago, Ill.
CROCKER, GEORGE GLOVER, 1016-1023 Old South Building, Boston, Mass.
CROOK, JAMES WALTER, Prof., Amherst College, Amherst, Mass.
CROSBY, JOHN SHERWIN, 335 W. 14th Street, New York City.
CROUTER, A. I., EDGERTON, Pa. Institute for the Deaf and Dumb, Mt. Airy, Philadelphia, Pa.
CROWELL, JOHN FRANKLIN, Bureau of Statistics, Treasury Dept., Washington. D. C.
CRUM, FRED STEPHEN, Prudential Insurance Co., Newark, N. J.
CRUNDEN, FREDERICK MORGAN, Public Library, St. Louis, Mo.
CUMMINGS, EDWARD, Prof., Harvard Univ., 104 Irving Street, Cambridge, Mass.

List of Members

17

- CUMMINGS, JOHN, Prof., Univ. of Chicago, Chicago, Ill.
 CURRAN, JAMES HARRIS, Tome Inst., Port Deposit, Md.
 CURTIS, CHARLES EDWARD, City Bank of New Haven, New Haven, Conn.
 CUSHING, JOHN PEARSONS, Prof., New Haven, Conn.
 CUTTING, R. FULTON, 32 Nassau Street, New York City.
 DABNEY, RICHARD HEATH, Prof., Univ. of Va., Charlottesville, Va.
 DA COSTA, JOSÉ S., L.L.D., Ca Garantia da Amazonia, Pará, North of Brazil.
 DAISH, JOHN BROUGHTON, Station B, Washington, D. C.
 DANIELS, WINTHROP MORE, Prof., Princeton Univ., Princeton, N. J.
 DART, H. P., 5931 St. Charles Avenue, New Orleans, La.
 *DAVIS, ANDREW MCFARLAND, Antiquarian, 10 Appleton Street, Cambridge, Mass.
 DAVIS, EDWARD H., 119 Columbia Street, West LaFayette, Ind.
 *DAVIS, HORACE, 1800 Broadway, San Francisco, Cal.
 DAVIS, JOHN, Pres., Detroit Chemical Works, 515 Cass Avenue, Detroit, Mich.
 DAVIS, JOHN W., Prin. of Public School 8, Borough of Bronx, New York City.
 DAVIS, MICHAEL M., 244 W. 104th Street, New York City.
 DAVIS, SAMUEL A., Danbury, Conn.
 DAY, ARTHUR MORGAN, 52 William Street, New York City.
 DAY, FRANCIS A., Springfield, Mass.
 *DEAN, CHARLES A., Dean Building, 60 India Street, Boston, Mass.
 DEFORREST, ROBERT W., 7 Washington Square, New York City.
 DEMPSEY, J. HARRY, Census Office, Washington, D. C.
 †DENISON UNIVERSITY, Granville, O.
 DENNY, CHARLES L., Dexter Horton Bank Building, Seattle, Wash.
 DETRICK, CHARLES R., Stanford University, Cal.
 †DETROIT PUBLIC LIBRARY, Detroit, Mich.
 DEVINE, EDWARD THOMAS, Circuit Road, New Rochelle, N. Y.
 DEWEY, DAVIS RICH, Prof., Mass. Inst. of Technology, Boston.
 DEXTER, SKYMOUR, Elmira, N. Y.
 DICKMAN, J. W., Upper Iowa Univ., Fayette, Iowa.
 *DILL, ARTHUR C., 821 Cleveland Avenue, Niagara Falls, N. Y.
 *DILL, JAMES BROOKS, 27 Pine Street, New York City.
 DIXON, FRANK HAIGH, Prof., Dartmouth College, Hanover, N. H.
 *DODD, SAMUEL C. T., 26 Broadway, New York City.
 DODGE (Miss) GRACE HOADLEY, 262 Madison Avenue, New York City.
 DODGE, RAYMOND E., Publisher *Money and Credit*, 25 Broad Street, New York City.
 DODGE, WILLIAM EARL, 11 Cliff Street, New York City.
 DONALD, MALCOLM, 70 State Street, Boston, Mass.
 DONNELLE, F. C., Maryville, Mo.

- DOTEN, CARROLL W., Mass. Inst. of Technology, 1541 Cambridge Street, Cambridge, Mass.
- DOUGHERTY, M. ANGELO, Cambridge, Mass.
- DOUTHIRT, W. F., Box 72, Glen Ridge, N. J.
- †DREXEL INSTITUTE LIBRARY, Philadelphia, Pa.
- DROPPERS, GARRETT, Pres. Univ. of S. D., Vermillion, S. D.
- DUBRUL, ERNEST F., Union Trust Building, Cincinnati, O.
- DUDLEY, CHARLES BENJAMIN, Drawer 334, Altoona, Pa.
- DUNBAR, R. E., 3 Odd Fellows' Block, South Bend, Ind.
- DURAND, EDWARD DANA, 1303 Columbia Road, Washington, D.C.
- DURHAM, EZRA D., Onarga, Ill.
- DYER, G. W., Instructor, Vanderbilt Univ., Nashville, Tenn.
- DYNES, JOHN HOWARD, 1305 30th Street, Washington, D.C.
- EASLEY, RALPH M., Secretary of the Civic Federation, 281 Fourth Avenue, New York City.
- EATON, J. SHIRLEY, Havemeyer Building, New York City.
- ECCLESTON, J. H., 910 St. Paul Street, Baltimore, Md.
- *EDDY, (Miss) SARAH J., 4 Bell Street, Providence, R. I.
- EDGERTON, CHARLES EUGENE, 80 V Street, N. W., Washington, D. C.
- °EDGEWORTH, FRANCIS YSIDRO, Prof., Baliol College, Oxford, England.
- EDMONDS, FRANKLIN SPENCER, Central High School, Philadelphia, Pa.
- EDMONDS, JAMES E., *Times-Democrat*, New Orleans, La.
- EDWARDS, C. W., Trinity College, Durham, N. C.
- ELIASON, ADOLPH O., Montevideo, Minn.
- ELKINS, STEPHEN BENTON, Elkins, W. Va.
- ELLWOOD, CHARLES A., Prof., Univ. of Mo., Columbia, Mo.
- ELY, RICHARD THEODORE, Prof., Univ. of Wis., Madison.
- ELY, ROBERT ERSKINE, 23 W. 44th Street, New York City.
- EMERY, HENRY CROSBY, Prof., Yale Univ., New Haven, Conn.
- †ENOCH PRATT FREE LIBRARY, Reading Room, Baltimore, Md.
- ERICKSON, HALFORD, Commissioner of Labor Statistics, Madison, Wis.
- EVANS, NELSON W., Portsmouth, O.
- EWING, JOHN GILLEPSIE, Notre Dame, Ind.
- FAIRCHILD, A. B., Crete, Neb.
- *FAIRCHILD, CHARLES STEBBINS, 76 Clinton Place, New York City.
- FAIRCHILD, F. R., Yale Univ., New Haven, Conn.
- FAIRLIE, JOHN ARCHIBALD, 524 S. State Street, Ann Arbor, Mich.
- FALKNER, ROLAND POST, Chief of Department of Documents, Library of Congress, Washington, D. C.
- FARNHAM, (Miss) ANNA LOIS, Bryn Mawr, Pa.
- FARNAM, HENRY WALCOTT, Prof., Yale Univ., 43 Hillhouse Avenue, New Haven, Conn.
- FARQUHAR, ARTHUR B., York, Pa.

- FARQUHAR, HENRY, Assistant Statistician, Census Office, Washington, D. C.
- FARWELL, JOHN, Jr., 148 Market Street, Chicago, Ill.
- FAST, RICHARD ELLSWORTH, Prof., Univ. of W. Va., Morgantown, W. Va.
- FELTER, WM. L., 996 Sterling Place, Brooklyn, N. Y.
- FERGUSON, HENRY, Prof., Trinity College, 123 Vernon Street, Hartford, Conn.
- *FERGUSON, WILLIAM C., Richmond, Ind.
- FETTER, FRANK ALBERT, Prof., Cornell Univ., Ithaca, N. Y.
- FIELDER, GEORGE L., 255 W. 95th Street, New York City.
- FILENE, EDWARD A., 453 Washington Street, Boston, Mass.
- FILLEBROWN, C. B., 68 Essex Street, Boston, Mass.
- FINLEY, JOHN HUSTON, Prof., Princeton Univ., Lawrenceville, N. J.
- FISHBACK, JOHN HOWARD, Interstate Commerce Commission, Washington, D. C.
- FISHER, F. COLQUHOUN, 746 W. North Avenue, Baltimore, Md.
- FISHER, GEORGE HARRISON, 308 Walnut Street, Philadelphia, Pa.
- FISHER, IRVING, Prof., Yale Univ., New Haven, Conn.
- FISHER, WILLARD CLARK, Prof., Wesleyan Univ., Middletown, Conn.
- FISK, GEORGE M., Prof., 906 W. California Avenue, Urbana, Ill.
- FITZGERALD, (Mrs.) R. Y., Mgr. West Side Branch, 38 King Street, New York City.
- FLOWER, FRANK A., Census Office, Washington, D. C.
- FLUX, A. W., Prof., McGill Univ., Montreal, Canada.
- FOLKS, HOMER, Genl. Sec'y. Nat. Conf. of Charities and Corrections, 19 E. 88th Street, New York City.
- FOLWELL, WILLIAM WATTS, Prof., Univ. of Minn., Minneapolis, Minn.
- †FORBES LIBRARY, Northampton, Mass.
- *FOOTE, ALLEN RIPLEY, Editor *Public Policy*, 625 Home Insurance Bldg., Chicago, Ill.
- FORD, HENRY J., Editor *Pittsburg Gazette*, Pittsburg, Pa.
- FORD, WORTHINGTON CHAUNCEY, Library of Congress, Washington, D. C.
- FORREST, J. DORSEY, Prof., Butler College, Indianapolis, Ind.
- *FOSTER, E. H., Prof., Glendale, O.
- FRADENBURGH, ADELBERT GRANT, Adelphi College, Brooklyn.
- FRANKENHEIMER, JOHN, 25 Broad Street, New York City.
- FRANKLAND, FRED WILLIAM, 346 Broadway, New York City.
- FRANKLIN, FABIAN, Prof., 1507 Park Avenue, Baltimore, Md.
- FRASER, ALEXANDER HUGH ROSS, Boardman Hall, Ithaca, N. Y.
- FREEHOFF, J. C., 415 W. 118th Street, New York City.
- FREEMAN, HARRISON, B., Jr., 50 State Street, Hartford, Conn.
- FREER, HAMLINE H., Prof., Cornell College, Mt. Vernon, Iowa.

- FRENEYEAR, THOMAS C., Lawlor Building, King and Yonge Streets, Toronto, Canada.
- FRIEDENWALD, HERBERT, 915 N. 16th Street, Philadelphia, Pa.
- †FRIEDLEIN, D. E., Krakau, Austria.
- *FULLER, PAUL, 68 William Street, New York City.
- FURBER, HENRY JEWETT, Jr., 659 The Rookery, Chicago, Ill.
- GAHAN, WILLIAM J., Whitecastle, Iberville Parish, La.
- †GALESBURG PUBLIC LIBRARY, Galesburg, Ill.
- GANNETT, HENRY, U. S. Geological Survey, Washington, D. C.
- GARDNER, HENRY BRAYTON, Prof., Brown Univ., 54 Stimson Avenue, Providence, R. I.
- GARFIELD, HARRY A., Garfield Building, Cleveland, O.
- GARRARD, JEPHTAH, 44 Johnston Building, Cincinnati, O.
- GARRISON, GEORGE PIERCE, Prof., Univ. of Texas, Austin, Tex.
- GARTZ, A. F., Lake Geneva, Wis.
- GAULT, FRANKLIN B., 607 N. I Street, Tacoma, Wash.
- GAVIN, FRANK E., 902 Majestic Street, Indianapolis, Ind.
- GEORGE, JOHN EDWARD, Prof., Northwestern Univ., Evanston, Ill.
- †GEORGIA, UNIVERSITY, Athens, Ga.
- GERLING, HENRY JOSEPH, 3936 Page Avenue, St. Louis, Mo.
- GHEHT, WILLIAM JAMES, 260 W. 54th Street, New York City.
- GIDDINGS, FRANKLIN HENRY, Prof., Columbia Univ., 150 W. 79th Street, New York City.
- °GIDE, CHARLES, Prof., Univ. of Montpellier, Montpellier, France.
- GILMAN, NICHOLAS PAINE, Editor *The New World*, Meadville, Pa.
- GILSON, N. S., Madison, Wis.
- GLADDEN, WASHINGTON, Columbus, O.
- GLASSON, WILLIAM H., Trinity College, Durham, N. C.
- GLENN, JOHN M., 617 Columbia Avenue, Baltimore, Md.
- GLESSNER, J. J., care Warden, Bushnell and Glessner Company, Chicago, Ill.
- GLICKSMAN, NATHAN, 448 Kenilworth Place, Milwaukee, Wis.
- GOODELL, EDWIN B., Montclair, N. J.
- †GOODELL, HENRY HILL, Pres. Mass. Agricultural College, Amherst, Mass.
- GOODNOW, FRANK JOHNSON, Prof., Columbia Univ., New York City.
- GOULD, ELGIN RALSTON LOVELL, 281 Fourth Avenue, New York City.
- GOVE, WILLIAM HENRY, P. O. Building, Salem, Mass.
- GOWDEY, CLINTON, 5 Elm Street, Springfield, Mass.
- GRAETZ, VICTOR, Hansengasse 6, Vienna, Austria.
- †GRAND PRAIRIE SEMINARY LIBRARY, Onarga, Ill.
- †GRAND RAPIDS PUBLIC LIBRARY, Grand Rapids, Mich.
- GRANT, FRANCIS W., Seattle, Wash.
- GRAY, JOHN CHIPMAN, 50 State Street, Boston, Mass.
- GRAY, JOHN HENRY, Prof., Northwestern Univ., Evanston, Ill.

- GREELY, OTTO E., 104 Phoenix Building, Minneapolis, Minn.
- *GREEN, DAVID I., Hartford, Conn.
- GREEN, JACOB L., Hartford, Conn.
- GREENE, FRANK, Care Bradstreets, 61 Elm Street, New York City.
- GREENE, JOHN, 61 Elm Street, New York City.
- GREENE, THOMAS LYMAN, 43 Cedar Street, New York City.
- *GREY, EARL ALBERT, Howick, Lesbury, Northumberland, England.
- GRIFFIN, CHARLES S., Imperial Univ., Tokio, Japan.
- GROAT, GEORGE G., 430 W. 118th Street, New York City.
- GROTON, W. M., The Dean's House, Woodland Avenue and Fiftieth Street, Philadelphia, Pa.
- *GULICK, JOHN THOMAS, Oberlin, O.
- GULICK, LUTHER, 236 Willoughby Avenue, Brooklyn, N. Y.
- GUNDAKER, H. GUY, 3421 Walnut Street, Philadelphia, Pa.
- GUNTON, GEORGE, Pres., Institute of Social Economics, 41 Union Square, New York City.
- HADLEY, ARTHUR TWINING, Pres. Yale Univ., New Haven, Conn.
- HAGERTY, JAMES E., Ohio State Univ., Columbus, O.
- HALLE, ERNST VON, Prof., 50 Achenbachstrasse 2, Berlin, W., Germany.
- HALSEY, JOHN JULIUS, Prof., Lake Forest, Ill.
- HAMILTON, C. J., Blackladies, Dinas Powis, Cardiff, Wales.
- HAMILTON, JAMES HENRY, Head Worker University Settlement, 184 Eldridge Street, New York City.
- HAMLIN, CHARLES SUMNER, 2 Raleigh Street, Boston, Mass.
- HAMMOND, JOHN HENRY, 30 Broad Street, New York City.
- HAMMOND, MATTHEW BROWN, Asst. Prof., 905 California Avenue, Urbana, Ill.
- HANCOCK, JAMES D., Franklin, Pa.
- HANGER, G. W. W., Chief Clerk, Department of Labor, Washington, D. C.
- *HANKS, (Mrs.) C. STEDMAN, 53 State Street, Boston, Mass.
- HANSHUE, J. J., Box 345, Lansing, Mich.
- *HARDING, W. E., Bethany, N. Y.
- HARKNESS, GEORGE S., Odd Fellows Building, Stockton, Cal.
- HARTWELL, EDWARD M., City Hall, Boston, Mass.
- †HARVARD COLLEGE LIBRARY, Cambridge, Mass.
- HATCH, LEONARD W., 466 A. Hamilton Street, Albany, N. Y.
- HATFIELD, HENRY RAND, Univ. of Chicago, Chicago, Ill.
- HATHAWAY, FRANK RANDEL, 146 W. 92d Street, New York City.
- *HATHAWAY, HARRISON, Corner Miami and Fort Streets, Toledo, O.
- HATTON, WILLIAM H., New London, Wis.
- HAWKINS, DELMER E., Prof., Syracuse Univ., Syracuse, N. Y.
- HAWLEY, FREDERICK B., 141 Pearl Street, New York City.
- HAZARD, F. R., Pres., Solvay Process Co., Syracuse, N. Y.
- HAZARD, R. S., Peace Dale, R. I.
- †HAZEN, LUCIUS B., Middletown, Conn.

- HEIM, EPHRAIM M., Bucknell Univ., Lewisburg, Pa.
 †HELENA PUBLIC LIBRARY, Helena, Mont.
 HENDERSON, CHARLES RICHMOND, Prof., Univ. of Chicago, Chicago, Ill.
 HENDERSON, HARRY B., Cheyenne, Wyoming.
 HERRICK, CHEESMAN A., Central High School, Philadelphia, Pa.
 HERRIOTT, FRANK I., Drake Univ., Des Moines, Iowa.
 HICKS, FREDERICK CHARLES, Prof., Univ. of Cincinnati, Cincinnati, O.
 HIESTER, A. V., Prof., 26 Race Avenue, Lancaster, Pa.
 HILL, JOSEPH ADNA, Census Office, Washington, D. C.
 HINES, WALKER D., Louisville & Nashville R. R., Louisville, Ky.
 HITCHCOCK, FRANK H., Dept. of Agriculture, Washington, D. C.
 HOBSON, JOHN ATKINSON, Elmstead, Limsfield, Surrey, England.
 HOLDEN, L. E., *The Plaindealer*, Cleveland, O.
 HOLDSWORTH, JOHN THOM, Drexel Institute, Philadelphia, Pa.
 HOLLANDER, JACOB H., Prof., Johns Hopkins Univ., Baltimore, Md.
 HOLLERITH, HERMAN, 1054 31st Street, Washington, D. C.
 HOLMAN, FREDERICK V., P. O. Box 504, Portland, Oregon.
 HOLMES, GEORGE K., Dept. of Agriculture, Washington, D. C.
 HOLT, HENRY, 29 West 23d Street, New York City.
 HOPKINS, WILLIAM ROWLANDSON, 820 Society for Savings, Cleveland, O.
 HORNE, PERLEY L., Prin., Dummer Academy, South Byfield, Mass.
 HORTON, GUY B., North Clarendon, Vt.
 HORWOOD, HENRY A., 44 Walker Street, New York City.
 HOTCHKISS, WILLARD E., 713 E. State Street, Ithaca, N. Y.
 HOURIGAN, JOHN, Public Accountant 45 Maiden Lane, Albany, N. Y.
 HOURWICH, ISAAC, Treasury Dept. Mint Bureau, Washington, D. C.
 HOUSTON, DAVID F., Prof., Univ. of Texas, 2304 San Antonio Street, Austin, Texas.
 *HOUSTON, SAMUEL FREDERIC, Chestnut Hill, Philadelphia, Pa.
 HOWARD, BURT ESTES, Prof., Stanford University, Cal.
 HOWE, FREDERICK CLEMON, Garfield Building, Cleveland, O.
 HOWE, SAMUEL T., 1925 West Street, Topeka, Kansas.
 HOWES, OSBORNE, 55 Kilby Street, Boston, Mass.
 HOXIE, ROBERT F., Instructor, Cornell Univ., Ithaca, N. Y.
 HUBBARD, W. P., 1421 Chapline Street, Wheeling, W. Va.
 HUBBELL, HENRY LYMAN, 409 Orange Street, New Haven, Conn.
 HUBERICK, C. H., Univ. of Texas, Austin, Texas.
 HULL, CHARLES HENRY, Prof., Cornell Univ., Ithaca, N. Y.
 HUNT, WILLIAM C., Statistical Expert, Census Office, Washington, D. C.
 HUNTER, WILLIAM BOYD, Census Office, Washington, D. C.
 HURD, RICHARD M., 59 Cedar Street, New York City.
 HURRY, CLARENCE B., 1002 Massachusetts Avenue, Washington, D. C.

- *HUTCHINSON, CHARLES HARE, 1617 Walnut Street, Philadelphia, Pa.
 HUTCHINSON, LINCOLN, Univ. of Cal., Faculty Club, Berkeley, Cal.
 HYDE, JOHN, Department of Agriculture, Washington, D. C.
 †IKEDA, HIDEZO, 27 Masagocho, Hongo, Tokio, Japan.
 *ILES, GEORGE, 5 Brunswick Street, Montreal, Canada.
 †ILLINOIS, UNIVERSITY, Champaign, Ill.
 †INDIANA STATE LIBRARY, Indianapolis Ind.
 †INDIANA UNIVERSITY, Bloomington, Ind.
 †INDIANAPOLIS PUBLIC LIBRARY, Indianapolis, Ind.
 INGALLS, MELVILLE E., Pres., Big Four Railway, Cincinnati, O.
 °INGRAM, JOHN KELLS, Prof., Trinity College, Dublin, Ireland.
 INSULL, SAMUEL, 139 Adams Street, Chicago, Ill.
 †IOWA STATE COLLEGE, Ames, Ia.
 IOWA STATE LIBRARY, Des Moines, Ia.
 †IOWA STATE NORMAL SCHOOL, Cedar Falls, Ia.
 †IOWA STATE UNIVERSITY, Iowa City, Ia.
 *IRWIN, DUDLEY M., 71 Board of Trade, Buffalo, N. Y.
 ISHIZAKA, M., Aoyama College, Tokio, Japan.
 JACKSON, CHARLES C., 24 Congress Street, Boston, Mass.
 JACOBSON, MAURICE, Bureau of Statistics, Department of Commerce
 and Labor, Washington, D. C.
 *JAMES, EDMUND JAMES, Pres., Northwestern Univ., Evanston, Ill.
 JANSCHUL, J., Prof., Moika 82, St. Petersburg, Russia.
 *JAYNE, HENRY LABARRE, 503 Chestnut Street, Philadelphia, Pa.
 JAYNES, ALLEN B., Tucson, Ariz.
 JEFFREY, JOSEPH A., Pres., Jeffrey Mfg. Co., 581 E. Town Street,
 Columbus, O.
 JENKS, JEREMIAH WHIPPLE, Prof., Cornell Univ., Ithaca, N. Y.
 †JERSEY CITY FREE LIBRARY, Jersey City, N. J.
 JEVONS, THOMAS E., 1301 Produce Exchange, New York City.
 †JOHN CRERAR LIBRARY, Chicago, Ill.
 †JOHNS HOPKINS UNIVERSITY, Baltimore, Md.
 JOHNSON, ALVIN SAUNDERS, Columbia University, New York City.
 JOHNSON, EDGAR H., Prof., Emory College, Oxford, Ga.
 JOHNSON, EMORY R., Prof., Univ. of Penn., Philadelphia, Pa.
 JOHNSON, FRANK S., 2521 Prairie Avenue, Chicago, Ill.
 JOHNSON, JOSEPH F., Prof., New York Univ., Washington Square,
 New York City.
 JONES, EDWARD D., Prof., Univ. of Mich., Ann Arbor, Mich.
 JUDSON, FREDERICK NEWTON, 500-506 Rialto Building, St. Louis,
 Mo.
 JUSTI, HERMAN, 355 Dearborn Street, Chicago, Ill.
 †KANSAS CITY PUBLIC LIBRARY, Kansas City, Mo.
 †KANSAS STATE NORMAL SCHOOL, Emporia, Kan.
 †KANSAS, UNIVERSITY, Lawrence, KAN.
 KASAHARA, SHO, care of B. Kasahara, 4 Akasaka, Omote 4 chome,
 Tokio, Japan.

- KEASBEY, LINDLEY MILLER, Prof., Bryn Mawr College, Bryn Mawr, Pa.
- KEITH, JOHN MEIGGS, San José, Costa Rica, Central America.
- KELLER, ALBERT D., Prof., Heidelberg Univ., Tiffin, O.
- *KELLER, ALBERT G., Yale Univ., New Haven, Conn.
- KELLEY, JOHN F., 284 West Housatonic Street, Pittsfield, Mass.
- *KELSEY, FRANCIS WILLEY, Prof., Univ. of Mich., 826 Tappan Street, Ann Arbor, Mich.
- KEMMERER, EDWIN W., Treas. Dept., Manila, P. I.
- KENNADAY, PAUL, Settlement Worker, 88 Grove Street, New York City.
- KENNAN, KOSSUTH KENT, 357 Kane Place, Milwaukee, Wis.
- KENNEDY, J. WILMER, 2 Emmett Street, Newark, N. J.
- KENNEDY, SINCLAIR, Readville, Mass.
- KENNEY, E., 402 W. Lucas Street, Creston, Ia.
- KENT, WM., 12 Sherman Street, Chicago, Ill.
- *KEYNES, JOHN NEVILLE, 6 Harvey Road, Cambridge, England.
- KEYSER, R. BRENT, 205 E. German Street, Baltimore, Md.
- KIDDER, CAMILLUS G., 27 William Street, New York City.
- KILLEBREW, J. B., Tobacco Expert, Nashville, Tenn.
- KILPATRICK, THOMAS, 410 N. 22d Street, Omaha, Neb.
- KINDER, FRANCIS SHANOR, 143 S. Perry Street, Villa Park Station, Denver, Col.
- †KING, P. S. & SON, 284 Great Smith Street, Westminster, London.
- KINGHORN, HENRY B., P. O. Box 748, New York City.
- KINLEY, DAVID, Prof., Univ. of Ill., Champaign, Ill.
- KINSMAN, DELOS O., State Normal School, Whitewater, Wis.
- KIRK, WILLIAM, Johns Hopkins Univ., Baltimore, Md.
- KLEENE, GUSTAV A., Prof., Trinity College, Hartford, Conn.
- KLEIN, JACOB, 902 Rialto Building, St. Louis, Mo.
- KNAPP, MARTIN A., Chairman, Interstate Commerce Commission, Washington, D. C.
- KNIGHT, GEORGE WELLS, Prof., Ohio State Univ., Columbus, O.
- KOHLER, MAX J., 115 E. 71st Street, New York City.
- KUCZYNSKI, ROBERT K., Thiergartenstr. 13, Berlin, Germany.
- KURSHIEDT, MANUEL AUGUSTUS, 35 Warren Street, New York City.
- LADD, CHARLES E., care Ladd & Tilton, Portland, Ore.
- LAMB, HENRY W., Brookline, Mass.
- LATHAM, CHARLES K., 559 Cass Avenue, Detroit, Mich.
- LAUGHLIN, J. LAURENCE, Prof., Univ. of Chicago, 5747 Lexington Avenue, Chicago, Ill.
- LAURENCE (Miss) MARTHA E., Lake Erie College, Painesville, O.
- LAUTERBACH, EDWARD, 22 William Street, New York City.
- *LEA, HENRY CHARLES, 2000 Walnut Street, Philadelphia, Pa.
- *LEESON, J. R., P. O. Box 2221, Boston, Mass.
- †LELAND STANFORD JR. UNIVERSITY, Stanford Univ., Palo Alto, Cal.

- LEROSSIGNOL, JAMES EDUARD, Prof., Univ. of Denver, University Park, Col.
- °LEROY-BEAULIEU, PAUL, Prof., Collège de France, Paris, France.
- LESLIE, GEORGE D., 119 S. Tioga Street, Ithaca, N. Y.
- °LEVASSEUR, PIERRE-ÉMILE, Prof., 26 Rue Monsieur-le-Prince, Paris, France.
- LÉVY, RAPHAËL-GEORGES, Prof., 80 Boulevard des Courcelles, Paris, France.
- LINDSAY, SAMUEL McCUNE, Department of Education, San Juan, Porto Rico.
- LIPMAN, F. L., care Wells, Fargo & Co.'s Bank, San Francisco, Cal.
- LIPPINCOTT, HAROLD E., Surrogate's Court, County Court House, New York City.
- LOEB, ISIDOR, Prof., Univ. of Mo., Columbia, Mo.
- †LOESCHER AND CO., Corso Umberto 307, Rome, Italy.
- LOEWY, BENNO, 206 Broadway, New York City.
- LOGAN, JAMES, General Manager U. S. Envelope Company, Worcester, Mass.
- LOGAN, WALTER SETH, 58 William Street, New York City.
- LOONEY, WILLIAM HENRY, Union Mutual Building, Portland, Me.
- LOOS, ISAAC ALTHAUS, Prof., State Univ. of Iowa, Iowa City, Iowa.
- †LOS ANGELES PUBLIC LIBRARY, Los Angeles, Cal.
- *LOUCHHEIM, SAMUEL K., West End Trust Building, Cor. Broad Street and S. Penn. Square, Philadelphia, Pa.
- *LOW, SETH, Ex-Mayor, 30 E. 64th Street, New York City.
- LOWDEN, FRANK O., 184 LaSalle Street, Chicago, Ill.
- LOWRY, JOHN C., 2115 Green Street, Philadelphia, Pa.
- LYMAN, ARTHUR THEODORE, P. O. Box 1717, Boston, Mass.
- MCCORMICK, ALEXANDER A., 726 S. Johns Avenue, Pasadena, Cal.
- MCCORMICK, HAROLD F., 215 Dearborn Street, Chicago, Ill.
- MCCREA, ROSWELL CHENEY, Brunswick, Me.
- McLAIN, JOHN SCUDDER, 1710 Dupont Avenue S., Minneapolis, Minn.
- MACLEAN, FRANCIS HERBERT, Suite 644 Unity Building, Chicago, Ill.
- McLEAN, SIMON JAMES, Prof., Stanford Univ., Cal.
- McMACKIN, JOHN M., Commissioner of Labor Statistics, Albany, N. Y.
- McNULTY, JOHN J., Prof., College of the City of New York, New York City.
- McPHERSON, LOGAN G., B. & O. Central Building, Baltimore, Md.
- McVEY, FRANK LEROND, Prof., Univ. of Minn., Minneapolis, Minn.
- *McDUFFIE, JOHN, The McDuffie School, 182 Central Street, Springfield, Mass.
- MACFARLANE, CHARLES WILLIAM, 52d and Market Streets, Philadelphia, Pa.
- MACKAY, JOHN, 25 King Street, W. Toronto, Canada.

- MACLEAN, JAMES ALEXANDER, Prof., University of Idaho, Moscow, Idaho.
- MACOMBER, A. E., 224 Spitzer Building, Toledo, O.
- MACRAE, HUGH, Wilmington, N. C.
- MACVEAGH, FRANKLIN, 29 Wabash Avenue, Chicago, Ill.
- *MACVEAGH, WAYNE, Brookfield Farm, Bryn Mawr, Pa.
- MACY, JESSE, Prof., Iowa College, Grinnell, Iowa.
- MACY, V. EVERIT, 68 Broad Street, New York City.
- MAITLAND, ALEXANDER, 14 E. 55th Street, New York City.
- †MALDEN PUBLIC LIBRARY, Malden, Mass.
- MALTBIE, MILO ROY, City Hall, New York City.
- *MARBURG, THEODORE, 14 W. Mt. Vernon Place, Baltimore, Md.
- MARKS, MARTIN A., 204 Garfield Building, Cleveland, O.
- °MARSHALL, ALFRED, Prof., Univ. of Cambridge, Cambridge, England.
- †MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Boston, Mass.
- †MASSACHUSETTS STATE LIBRARY, State House, Boston, Mass.
- MATHESON, ALEXANDER E., Janesville, Wis.
- MATHEWS, BYRON C., City High School, Newark, N. J.
- MAYER, LEVY, care of Moran, Kraus and Mayer, Chicago, Ill.
- MAYNARD, ARCHIBALD B., 195 Manning Street, Hillsdale, Mich.
- MEAD, EDWIN DOAK, 20 Beacon Street, Boston, Mass.
- †MECHANICS' INSTITUTE, San Francisco, Cal.
- MECK, ALEXANDER VON, Board of Directors, Moscow and Kazan Railway, Moscow, Russia.
- MEEKER, ROYAL, 235 W. 123d Street, New York City.
- †MERCANTILE LIBRARY, Baltimore, Md.
- †MERCANTILE LIBRARY, Astor Place, New York City.
- †MERCANTILE LIBRARY, Broadway and Locust Streets, St. Louis, Mo.
- *MERCER, GEORGE GLUYAS, Drexel Building, Philadelphia, Pa.
- MERRIAM, A. R., Prof., Hartford Theolog. Sem., 314 Collins Street, Hartford, Conn.
- MERRIAM, WILLIAM RUSH, Director of the Twelfth Census, Washington, D. C.
- MERRIFIELD, WEBSTER, Pres., Univ. of North Dakota, University, N. D.
- MERRILL, WILLARD, 95 Prospect Avenue, Milwaukee, Wis.
- MERRIMAN, JAMES D., 141 Broadway, New York City.
- METCALF, HENRY CLAYTON, Tufts College, Mass.
- MEYER, BALTHASAR HENRY, Univ. of Wis., Madison, Wis.
- MEYER, HUGO R, Harvard Univ., Cambridge, Mass.
- MICHAEL, CHARLES W., Perryman, Hartford Co., Md.
- †MICHIGAN AGRICULTURAL COLLEGE, Agricultural P. O., Ingham Co., Mich.
- †MICHIGAN STATE LIBRARY, Lansing, Mich.
- †MICHIGAN, UNIVERSITY, Ann Arbor, Mich.
- MIKAMI, YOSHINAGA, Kofu, Kai, Japan.

- MIKKELSEN, MICHAEL ANDREW, 32 W. 123d Street, New York City.
 MILLER, ADOLPH CASPER, Prof., Univ. of Cal., Berkeley, Cal.
 MILLER, B. K., Jr., 102 Wisconsin Street, Milwaukee, Wis.
 MILLER, FREDERICK A., 1175 Neil Avenue, Columbus, O.
 MILLER, WALLACE E., Asst. Prof., Ohio State Univ., Columbus, O.
 MILLION, JOHN W., Hardin College, Mexico, Mo.
 MILLIS, H. A., Palo Alto, Cal.
 MILLS, HERBERT ELMER, Prof., Vassar College, Poughkeepsie, N.Y.
 †MILWAUKEE PUBLIC LIBRARY, Milwaukee, Wis.
 †MINNEAPOLIS PUBLIC LIBRARY, Minneapolis, Minn.
 †MINNESOTA, UNIVERSITY, Minneapolis, Minn.
 †MISSOURI, UNIVERSITY, Columbia, Mo.
 MITCHELL, JAMES E., Alma College, Alma, Mich.
 MITCHELL, W. C., Univ. of Cal., Berkeley, Cal.
 MIXTER, CHARLES WHITNEY, Burlington, Vt.
 MOFFETT, SAMUEL E., 351 W. 114th Street, New York City.
 MOIR, HENRY, 346 Broadway, New York City.
 MOMSEN, HART, Census Office, Washington, D. C.
 MONAGHAN, JAMES C., Univ. of Wis., Madison, Wis.
 MONIN, LOUIS C., Prof., Armour Inst. of Technology, Chicago, Ill.
 MOODY, JOHN, Cranford, N. J.
 MOORE, FREDERICK WIGHTMAN, Prof., Vanderbilt Univ., Nashville, Tenn.
 MOORE, HENRY LUDWELL, Prof., Columbia Univ., New York City.
 MOORE, ROBERT, Laclede Building, St. Louis, Mo.
 MORAN, THOMAS A., 4710 Vincennes Avenue, Chicago, Ill.
 MORRIS, FRANK R., 301 Pleasant Street, Bennington, Vt.
 MORSE, (Miss) FRANCES R., 12 Marlborough Street, Boston, Mass.
 MORTON, I. W., 49 Vandeventer Place, St. Louis, Mo.
 MOSELY, EDWARD AUGUSTUS, Sec'y Interstate Commerce Commission, Washington, D. C.
 MOSLEY, WAYNE T., 425 Bruen Street, Madison, Wis.
 MOURASSE, H. O., 24 Harukimatchi Sautchome, Tokio, Japan.
 MOXOM, PHILIP S., 83 Dartmouth Terrace, Springfield, Mass.
 MUHLEMAN, MAURICE LOUIS, 25 Broad Street, New York City.
 MUHSE, A. C., Cornell Univ., 92 Cascadilla Place, Ithaca, N. Y.
 MUNROE, JAMES P., 77-79 Sumner Street, Boston, Mass.
 MURPHY, CHARLES ROBERT, 665 Prairie Avenue, Decatur, Ill.
 MURPHY, JAMES F., 271 Main Street, Pawtucket, R. I.
 MUSSEY, HENRY R., 32 Waverly Place, New York City.
 MYERS, WM. STARR, Country School, Charles Street Avenue, Baltimore, Md.
 NAGEL, CHARLES, Security Building, St. Louis, Mo.
 NARDIN, W. T., Columbia, Mo.
 †NEBRASKA STATE LIBRARY, Lincoln, Neb.
 †NEBRASKA, UNIVERSITY, Lincoln, Neb.
 NEEB, CHARLES W., P. O. Box 127, Pittsburg, Pa.

- NEEDHAM, CHARLES W., 1420 H Street, Washington, D. C.
 NELSON, HENRY L., Prof., Williams College, Williamstown, Mass.
 †NEWARK PUBLIC LIBRARY, Newark, N. J.
 †NEW BEDFORD PUBLIC LIBRARY, New Bedford, Mass.
 †NEWBERRY LIBRARY, Chicago, Ill.
 NEWCOMB, SIMON, 1620 P Street, Washington, D. C.
 NEWCOMB, HARRY TURNER, Bond Building, Washington, D. C.
 †NEW HAMPSHIRE STATE LIBRARY, Concord, N. H.
 NEWLIN, THOMAS, Prof., Guilford College, N. C.
 †NEW YORK PUBLIC LIBRARY, 40 Lafayette Place, New York City.
 †NEW YORK STATE LIBRARY, Albany, N. Y.
 †NEW YORK UNIVERSITY LIBRARY, Univ. Heights, New York City.
 NIELL, CHARLES, P., Prof., Catholic Univ., Washington, D. C.
 NIMMO, JOSEPH, Jr., Huntington, Long Island, N. Y.
 NIVEN, JOHN BALLANTINE, 30 Broad Street, New York City.
 NORTH, SIMON NEWTON DEXTER, 683 Atlantic Avenue, Boston, Mass.
 †NORTH CAROLINA, UNIVERSITY, Chapel Hill, N. C.
 †NORTHWESTERN UNIVERSITY, Evanston, Ill.
 NORTON, FRED L., 434 Tremont Building, Boston, Mass.
 NORTON, J. PEASE, Yale Univ., 563 Orange Street, New Haven, Conn.
 NOVES, ALEXANDER DANA, *Evening Post*, New York City.
 †OBERLIN COLLEGE, Oberlin, O.
 †OHIO STATE LIBRARY, Columbus, O.
 †OHIO STATE UNIVERSITY, Columbus, O.
 †OKLAHOMA, UNIVERSITY, Norman, Oklahoma.
 OLCOTT, W. HARRY, Census Office, Agricultural Division, Washington, D. C.
 OLSEN, ROBERT B., 193 St. Nicholas Avenue, New York City.
 †OMAHA PUBLIC LIBRARY, Omaha, Neb.
 †ONTARIO LEGISLATIVE LIBRARY, Toronto, Ont.
 PAGE, EDWARD D., 238 E. 15th Street, New York City.
 PAGE, THOMAS WALKER, Prof., Univ. of Texas, 1703 West Avenue, Austin, Texas.
 PAINE, ROBERT TREAT, 6 Joy Street, Boston, Mass.
 *PALGRAVE, ROBERT HARRY INGLIS, Belton, near Great Yarmouth, Norfolk, England.
 PARK, G. A., Louisville & Nashville R. R., Louisville, Ky.
 PARKER, ADELLA M., Seattle High School, Seattle, Wash.
 PARKER, FRANCIS W., 1410 Marquette Building, Chicago, Ill.
 PARSONS, (Mrs.) HERBERT, 112 East 35th Street, New York City.
 PATTEN, SIMON NELSON, Prof., Univ. of Penn., Philadelphia, Pa.
 PATTERSON, WILLIAM R., 746 St. Nicholas Avenue, New York City.
 PATTON, JOHN, Jr., Grand Rapids, Mich.
 *PEABODY, GEORGE FOSTER, 27 Pine Street, New York City.
 †PEABODY INSTITUTE, Baltimore, Md.
 PEARMAIN, SUMNER B., 53 State Street, Boston, Mass.
 PEARSON, E. C., 175 Remsen Street, Brooklyn, N. Y.

- PECKHAM, WHEELER HAZARD, 80 Broadway, New York City.
†PENNSYLVANIA STATE LIBRARY, Harrisburg, Pa.
†PENNSYLVANIA, UNIVERSITY, Philadelphia, Pa.
PERKINS, JACOB H., 14 Victoria Square, Clifton, Bristol, England.
PERSON, HARLOW S., Dartmouth College, Hanover, N. H.
PETERS, EDWARD T., 131 E Street, N. W., Washington, D. C.
PETTIGREW, E. S., Great Southern Hotel, Columbus, O.
†PHILADELPHIA LIBRARY, Juniper and Locust Streets, Philadelphia, Pa.
PHILLIPS, JOHN B., Boulder, Col.
*PHIPPS, LAWRENCE C., 1008 Farmers' Bank Building, Pittsburg, Pa.
PIERCE, (Miss) CAROLINE F., Wellesley College, Wellesley, Mass.
°PIERSON, N. G., Prof., The Hague, Holland.
PINCHOT, GIFFORD, 1705 Rhode Island Avenue, N. W., Washington, D. C.
PINKHAM, GEORGE RIPLEY, Headmaster, Searles' High School, Great Barrington, Mass.
†PLAINFIELD PUBLIC LIBRARY, Plainfield, N. J.
PLATT, WALTER B., 802 Cathedral Street, Baltimore, Md.
PLEHN, CARL COPPING, Prof., Univ. of Cal., Berkeley, Cal.
PLIMPTON, GEORGE A., 70 Fifth Avenue, New York City.
†POLITICAL SCIENCE CLUB OF YALE UNIVERSITY, New Haven, Conn.
†POMONA COLLEGE, Claremont, Cal.
POPE, JESSE ELIPHALET, Prof., Univ. of Mo., Columbia, Mo.
POPPELTON, WILLIAM S., Room 314 First National Bank, Omaha, Neb.
PORTER, WILLIAM H., 56 E. 67th Street, New York City.
POWERS, FRED PERRY, 1703 Rittenhouse Street, Philadelphia, Pa.
POWERS, HARRY HUNTINGTON, 201 Clarendon Street, Boston, Mass.
POWERS, LEGRAND, 3007 15th Street, N. W., Washington, D. C.
PRATT, SERENO S., 104 Cambridge Place, Brooklyn, N. Y.
†PRATT INSTITUTE FREE LIBRARY, Brooklyn, N. Y.
PRESCOTT, ARTHUR TAYLOR, Prof., Louisiana State Univ., 713 North Street, Baton Rouge, La.
PRESTON, HAROLD, Pioneer Building, Seattle, Wash.
PRICE, WILLIAM H., 87 Hammond Street, Cambridge, Mass.
†PRINCETON UNIVERSITY, Princeton, N. J. (two copies.)
PROUTY, CHARLES A., Newport, Vt.
†PROVIDENCE PUBLIC LIBRARY, Providence, R. I.
PURDY, LAWSON, Room 808, 52 William Street, New York City.
PUTNAM, (Miss) BERTHA, 335 W. 86th Street, New York City.
PUTNAM, HARRINGTON, 45 William Street, New York City.
PUTNAM, HERBERT, Library of Congress, Washington, D. C.
QUAINTANCE, H. W., High School, Lincoln, Neb.
†RADICAL CLUB, Scottsdale, Pa.
RAFFALOVICH, A., 19 Avenue Hoche, Paris, France.
RAMAGE, BURR JAMES, Prof., Univ. of South, Sewanee, Tenn.

- RAND, GEORGE C., Lawrence Station, N. Y.
 RANDOLPH, E. F., 1212 Madison Street, Toledo, O.
 RAPER, CHARLES LEE, Prof., Univ. of North Carolina, Chapel Hill, N. C.
 RAWLES, WILLIAM A., Prof., Indiana Univ., Bloomington, Ind.
 RAY, JOSEPH G., Unionville, Mass.
 RAYMOND, JEROME HALL, Morgantown, W. Va.
 RAYNER, ALBERT W., 1814 Eutaw Place, Baltimore, Md.
 †REFORM CLUB, 233 Fifth Avenue, New York City.
 REYNOLDS, ALLEN H., Walla Walla, Wash.
 †REYNOLDS LIBRARY, Rochester, N. Y.
 †RHODE ISLAND STATE LIBRARY, Providence, R. I.
 RHODES, JAMES FORD, 392 Beacon Street, Boston, Mass.
 RICH, JOSEPH W., Iowa City, Ia.
 RICHARDSON, VICTOR P., Janesville, Wis.
 RICHMOND, THOMAS C., Madison, Wis.
 †RIGBY, W. C., 74 King William Street, Adelaide, South Australia.
 RIPLEY, WILLIAM Z., Prof., Harvard Univ., Newton Centre, Mass.
 RIPPEY, CHARLES MCKAY, 607 21st Street, N. W., Washington, D. C.
 RIPTON, BENJAMIN HENRY, Prof., Union College, Schenectady, N. Y.
 RIVES, GEORGE L., 32 Nassau Street, New York City.
 ROBBINS, FRANCIS L., 232 Fifth Avenue, Pittsburg, Pa.
 ROBERTS, GEORGE E., Director of Mint, Washington, D. C.
 *ROBINSON, (Mrs.) JANE BANCROFT, 425 Cass Avenue, Detroit, Mich.
 ROBINSON, MAURICE HENRY, Prof., Univ. of Ill., Urbana, Ill.
 ROBINSON, PHILIP A., 14 Clark Street, Brattleboro, Vt.
 ROBINSON, SAMUEL ADAMS, 135 W. 22nd Street, Portland, Ore.
 †ROCHESTER, UNIVERSITY, Rochester, N. Y.
 ROGERS, CHARLES B., 161 Park Avenue, Utica, N. Y.
 ROGERS, (Mrs.) EMMA W., 413 Orange Street, New Haven, Conn.
 ROOT, LOUIS CARROLL, Sound Currency Committee, Reform Club, 46 Wall Street, New York City.
 ROPES, WILLIAM LADD, Librarian of Andover Theological Seminary, Andover, Mass.
 ROSENTHAL, LESSING, Suite 1007 Ft. Dearborn Building., Chicago, Ill.
 ROSEWATER, VICTOR, Editor *Omaha Bee*, Omaha, Neb.
 ROSS, EDWARD ALSWORTH, Prof., Univ. of Neb., Lincoln, Neb.
 ROWE, LEO S., Ph.D., Asst. Prof., Univ. of Penn., Philadelphia, Pa.
 RUSSELL, JOHN M., Treas., Crompton & Knowles Loom Works, Worcester, Mass.
 RUSSELL, WILLIAM HEPBURN, Postal Telegraph Building, New York City.
 RUTTER, FRANK ROY, U. S. Dept. of Agr., Washington, D. C.
 RYDEN, OTTO G., 1947 Maple Avenue, Evanston, Ill.
 RYMAN, J. H. T., Missoula, Mont.
 †ST. LOUIS PUBLIC LIBRARY, St. Louis, Mo.

- †ST. PAUL PUBLIC LIBRARY, St. Paul, Minn.
 SAKOLSKI, A. M., Johns Hopkins Univ., Baltimore, Md.
 SAMS, CONWAY W., 206 Courtland Street, Baltimore, Md.
 SANBORN, JOHN BELL, Madison, Wis.
 SANDERS, Prof. FREDERIC W., Thomas C. Clarkson Memorial
 School of Technology, Potsdam, N. Y.
 †SAN FRANCISCO NEWS CO., 342 Geary Street, San Francisco, Cal. (2
 copies.)
 †SAN FRANCISCO FREE PUBLIC LIBRARY, City Hall, San Francisco,
 Cal.
 *SANGER, WILLIAM CARVEY, Sangerfield, N. Y.
 SANO, ZENSAKU, Higher Commercial College, Tokio, Japan.
 SAUTER, WILLIAM F., 1637 Diamond Street, Philadelphia, Pa.
 SAYLES, (Miss) MARY B., Tenement House Inspector, 6 Barrow
 Street, New York City.
 SCHAPER, WILLIAM A., Univ. of Minn., Minneapolis, Minn.
 SCHMIDT, LOUIS B., High School, Webster City, Ia.
 SCHOFF, WILFRED H., 233 S. Fourth Street, Philadelphia, Pa.
 SCHWAB, GUSTAV HENRY, 5 Broadway, New York City.
 SCHWAB, JOHN CHRISTOPHER, Prof., Yale Univ., *Yale Review*, New
 Haven, Conn.
 *SCOTT, AUSTIN, New Brunswick, N. J.
 SCOTT, WILLIAM AMASA, Prof., Univ. of Wis., Madison, Wis.
 SCOVEL, SYLVESTER FITHIAN, Pres., Univ. of Wooster, Wooster, Ohio.
 SCOVIL, SAMUEL, 711 Cuyahoga Building, Cleveland, Ohio.
 †SCRANTON PUBLIC LIBRARY, Scranton, Pa.
 SCRIPPS, JAMES E., 598 Trumbull Avenue, Detroit, Mich.
 *SCUDDER, DOREMUS, 44 Warren Avenue, Woburn, Mass.
 *SEAGER, HENRY ROGERS, Prof., Columbia Univ., New York City.
 SEATTLE PUBLIC LIBRARY, Seattle, Wash.
 *SELIGMAN, EDWIN ROBERT ANDERSON, Prof., Columbia Univ., 324
 W. 86th Street, New York City.
 *SELIGMAN, ISAAC NEWTON, 36 W. 54th Street, New York City.
 SHAW, ALBERT, Editor *The American Monthly Review of Reviews*,
 New York City.
 SHEPERD, FRED STRONG, Prof., Asbury Park, N. J.
 SHEPPARD, H. N., Home Life Insurance Co., 256 Broadway, New
 York City.
 SHEVLIN, T. H., 129 Oak Grove Street, Minneapolis, Minn.
 SHIBLEY, GEORGE H., 38 B Street, N. W., Bliss Building, Washing-
 ton, D. C.
 SHIRASU, C., care of Viscount Kuki, Kobe, Japan.
 SHORTT, ADAM, Prof., Queen's Univ., Kingston, Ont.
 SIMES, WILLIAM, Petersham, Mass.
 SIMKHOVITCH, VLADIMIR G., Columbia University, New York City.
 SIMPSON, JAMES HOPE, care of Bank of Liverpool, Liverpool, Eng.
 SITES, CLEMENT MOORE LACEY, Nanyang College, Shanghai, China.

- SMALL, ALBION W., Prof., Univ. of Chicago, Chicago, Ill.
 SMALLEY, HARRISON S., 820 Kingsley Street, Ann Arbor, Mich.
 *SMART, WILLIAM, Lecturer on Political Economy, Queen Margaret College, Glasgow, Scotland.
 SMITH, CHARLES LEE, Prof., William Jewell College, Liberty, Mo.
 SMITH, DELEVAN, Lake Forest, Ill.
 SMITH, EDWARD SNELL, *New Orleans Picayune*, New Orleans, La.
 SMITH, ERNEST A., Allegheny College, Meadville, Pa.
 *SMITH, JACOB G., 25 Winthrop Hall, Cambridge, Mass.
 SMITH, J. ALLEN, Univ. of Wash., Seattle, Washington.
 SMITH, (Mrs.) MARY ROBERTS, Palo Alto, Cal.
 SMITH, MILTON W., P. O. Drawer 51, Portland, Oregon.
 SMITH, SAMUEL G., Prof., Univ. of Minn., 125 College Avenue, St. Paul, Minn.
 SMITH, SPARROW, Pres. Capital Banking and Trust Co., Sacramento, Cal.
 SMITH, THOMAS GUILFORD, 9 German Insurance Building, Buffalo, N. Y.
 SMYTH, DELOS DEWOLF, Prof., Hamilton College, Clinton, N. Y.
 SNIDER, GUY E., 408 W. 115th Street, New York City.
 SNOW, MARSHALL S., Washington Univ., St. Louis, Mo.
 †SOUTH DAKOTA AGRICULTURAL COLLEGE, Brookings, S. D.
 SOUTHER, CHARLES EDWARD, 128 Broadway, New York City.
 †SOUTHERN, H. & Co., 140 Straud, London, W. C., England.
 SOUTHWORTH, C. H., Springfield, Mass.
 SPENCER, CHARLES WORTHEN, Prof., Colgate Univ., Hamilton, N. Y.
 SPENCER, JOHN OAKLEY, Pres., Morgan College, Baltimore, Md.
 SPENCER, (Miss) PAULINE W., 3421 Race Street, Philadelphia, Pa.
 SPIEGELBERG, FREDERICK, 44 Broad Street, New York City.
 SPIEGLE, G. E., 2115 N. 12th Street, Philadelphia, Pa.
 SPRAGUE, OLIVER MITCHELL WENTWORTH, 21 Stoughton Hall, Cambridge, Mass.
 *SPRAGUE, RUFUS F., Greenville, Mich.
 †SPRINGFIELD PUBLIC LIBRARY, Springfield, Mass.
 STANGELAND, CHARLES EMIL, 416 W. 118th Street, New York City.
 STANTON, EDGAR WILLIAM, Prof., State Agricultural College, Ames, Iowa.
 †STEIGER & Co., Newspaper Box 298, New York City. (4 copies.)
 STEPHENS, HENRY MORSE, Prof., Univ. of Cal., Berkeley, California.
 STERNS, WORTHY PUTNAM, 1723 G Street, Washington, D. C.
 STEUART, WILLIAM M., The Kensington, Washington, D. C.
 STEWART, JOHN LAMMEY, Lehigh Univ., South Bethlehem, Pa.
 STINE, MATIUS, 34 E. 72d Street, New York City.
 STOKES, ANSON PHELPS, 100 William Street, New York City.
 STOKES, H. K., Mechanics' National Bank, Trenton, N. J.
 STONE, ALFRED HOLT, 200 A Street, S. E., Washington, D. C.

- STONE, NAHUM I., 2006 Washington Avenue, New York City.
 STRAUS, ISIDOR, 6th Avenue and 14th Street, New York City.
 STRAUS, OSCAR SOLOMON, 42 Warren Street, New York City.
 STREET, ROBERT G., Judge 56th Judicial District of Texas, Galveston, Tex.
 STRONG, THOMAS N., Portland, Oregon.
 STUBBS, WILLIAM C., Audubon Park, New Orleans, La.
 †SUMNER, (Miss) HELEN L., 1029 University Avenue, Madison, Wis.
 †SWARTHMORE COLLEGE, Swarthmore, Pa.
 SWAIN, HENRY H., Prof., Dillon, Mont.
 *SWAYNE, WAGER, 195 Broadway, New York City.
 TAKASU, TASUKE, Japanese Legation, Pekin, China.
 TAKEMURA, KINJI, care of Y. Ikeda, 27 Masagocho Hongo, Tokio, Japan.
 †TAMAYA, T. & Co., 5 Guiza Sanchome, Kyobashiku, Tokio, Japan.
 TANKA, M. I., Librarian Imperial Library, Tokio, Japan.
 TARBELL, (Miss) IDA M., *McClure's Magazine*, New York City.
 TAUSSIG, FRANK WILLIAM, Prof., Harvard Univ., 2 Scott Street, Cambridge, Mass.
 TAYLOR, FRED MANVILLE, Prof., Univ. of Mich., Ann Arbor, Mich.
 TAYLOR, GRAHAM, Prof., Christian Sociological Cong'l Sem., 43 Warren Avenue, Chicago, Ill.
 TAYLOR, H. C., Prof., Univ. of Wis., Madison, Wis.
 TAYLOR, WILLIAM G. LANGWORTHY, Prof., Univ. of Neb., Lincoln, Neb.
 TENNEY, D. K., 108 E. Main Street, Madison, Wis.
 TENNEY, M. A., 7147 Hermitage Street, Pittsburg, Pa.
 †TEXAS, UNIVERSITY, Austin, Texas.
 THACH, CHARLES C., Pres. Ala. Polytechnic Inst., Auburn, Ala.
 *THOM, DECOURCEY WRIGHT, 119 East Baltimore Street, Baltimore, Md.
 THOMPSON, CHARLES N., Treas. George School, Bucks Co., Pa.
 THOMPSON, SANDFORD ELEAZER, Newton Highlands, Mass.
 THURBER, CHARLES HERBERT, 29 Beacon Street, Boston, Mass.
 *THURBER, FRANCIS B., 90 Broadway, New York City.
 THWAITES, REUBEN GOLD, Secy., State Historical Society, Madison, Wis.
 TILDSLEY, JOHN L., 520 W. 123d Street, New York City.
 TIMLIN, W. H., 105 Grand Avenue, Milwaukee, Wis.
 TITSWORTH, JUDSON, 291 Ogden Avenue, Milwaukee, Wis.
 TOOKE, CHARLES WESLEY, 606 University Avenue, Syracuse, N. Y.
 †TORONTO, UNIVERSITY, Toronto, Canada.
 TUCKER, GEORGE FOX, 616 Barristers' Hall, Boston, Mass.
 TUCKEV, EDSON NEWTON, Yale Univ., 23 Lynwood Street, New Haven, Conn.
 †TUFTS COLLEGE, Tufts College, Mass.
 †TULANE UNIVERSITY LIBRARY, New Orleans, La.

- TUTTLE, CHARLES AUGUSTUS, Prof., Wabash College, Crawfordsville, Ind.
- †TWIETMEYER, A., Leipzig, Germany.
- TWINING, A. C., Asbury Park, N. J.
- TYSON, MALCOLM V., 216 N. Charles Street, Baltimore, Md.
- UNDERHILL, C. M., Librarian, Utica Public Library, Utica, N. Y.
- UPHAM, FREDERICK W., Pres. Board of Review, Old Colony Building, Chicago, Ill.
- URDAHL, THOMAS K., 730 N. Weber Street, Colorado Springs, Col.
- VAN VORHIS, FLAVIUS JOSEPHUS, 1129 Stevenson Building, Indianapolis, Ind.
- VREASEY, JOHN H., Lomagundi Dist., Rhodesia, S. Africa.
- VEBLEN, THORSTEIN B., Asst. Prof., Univ. of Chicago, Chicago, Ill.
- VEDITZ, C. W. A., Bates College, Lewiston, Me.
- VENABLE, RICHARD M., 205 E. German Street, Baltimore, Md.
- †VERMONT, UNIVERSITY, Burlington, Vt.
- VIETH, HENRY A., 234 11th Street, N. E., Washington, D. C.
- VICKERS, E. H., 2 Nichome, Mita, Shiba, Tokio, Japan.
- VINCENT, GEORGE EDGAR, Prof., Univ. of Chicago, 5737 Lexington Avenue, Chicago, Ill.
- VIRTUE, G. O., Prof., 758 W. Broadway, Winona, Minn.
- †WABASH COLLEGE, Crawfordsville, Ind.
- WADLIN, HORACE G., Librarian Boston Public Library, Boston, Mass.
- *WADSWORTH, H. L., Editor *Mining and Scientific Review*, Denver, Col.
- °WAGNER, ADOLPH, Prof., Univ. of Berlin, Berlin, Germany.
- WALKER, C. S., Mass. Agricultural College, Amherst, Mass.
- WALKER, FRANCIS, Associate Prof., Adelbert College, 46 Nantucket Street, Cleveland, O.
- WALKER, T. B., 803 Hennepin Avenue, Minneapolis, Minn.
- WALLING, WILLIAM ENGLISH, 184 Eldridge Street, New York City.
- °WALRAS, LEON, Prof., Univ. of Lausanne, Clarens, Vand, Switzerland.
- *WALSH, CORRE, M., Bellport, L. I.
- WARBURG, F. M., 27 Pine Street, New York City.
- WARD, EDWARD G., Jr., Department of Agriculture, Washington, D. C.
- WARD, JOHN H., 34 Kenyon Building, Louisville, Ky.
- WARD, LESTER FRANK, 1464 R. I. Avenue, Washington, D. C.
- WARNER, ADONIRAM JUDSON, Marietta, O.
- WARREN, WILLIAM R., 81 Fulton Street, New York City.
- †WASHINGTON, UNIVERSITY, Seattle, Wash.
- WATERMAN, EDGAR F., 223 Asylum Street, Hartford, Conn.
- WATKINS, GEORGE P., 215 Mitchell Street, Ithaca, N. Y.
- WEATHERLY, ULYSSES GRANT, Prof., Indiana Univ., Bloomington, Ind.

- WEAVER, E. E., Harrodsburg, Ky.
 WEAVER, JAMES RILEY, Prof., DePauw Univ., Greencastle, Ind.
 WEBER, ADNA F., Chief Statistician, New York State Department of Labor, 302 Washington Avenue, Albany, N. Y.
 WEBER, GUSTAVUS A., Bureau of Labor, Washington, D. C.
 WEEKS, RUFUS W., 346 Broadway, New York City.
 WELLES, F. R., 44 Rue St. Didier, Paris, France.
 WELLS, DAVID COLLIN, Prof., Dartmouth College, Hanover, N. H.
 WELLS, PHILIP P., 72 Mansfield Street, New Haven, Conn.
 WEST, MAX, Treasury Department, San Juan, Porto Rico.
 WEST, WILLIAM L., 330 West 3rd Street, St. Paul, Minn.
 WESTENHAVER, D. C., 929 Garfield Building, Cleveland, O.
 †WESTFIELD ATHENAEUM, Westfield, Mass.
 WESTON, CHARLES, 1220 L. Street, Lincoln, Neb.
 WESTON, NATHAN AUSTEN, Asst. Prof., Univ. of Ill., Champaign, Ill.
 †WEST VIRGINIA UNIVERSITY, Morgantown, W. Va.
 *WETMORE, GEORGE PEABODY, Newport, R. I.
 WEYL, WALTER E., 1611 N. 15th Street, Philadelphia, Pa.
 WHEELER, FRED B., Genl. Mgr. Binghamton Gas Works, 30 Chenango Street, Binghamton, N. Y.
 WHITAKER, ALBERT C., Stanford Univ., Palo Alto, Cal.
 WHITE, ANDREW DICKSON, Former U. S. Minister to Germany Ithaca, N. Y.
 WHITE, FRANK, Gov. of N. D., Bismarck, N. D.
 WHITE, HERBERT H., Hartford, Conn.
 WHITE, HORACE, 18 W. 69th Street, New York City.
 *WHITE, JULIAN LEROY, 51 News Building, Baltimore, Md.
 WHITE, (Miss) MARGARET, 11 Highland Street, Cambridge, Mass.
 WHITE, PETER, Marquette, Mich.
 WHITNEY, EDSON LEONE, 1118 K Street, N. E., Washington, D. C.
 WHITTLESEY, (Miss) SARAH SCOVILL, 367 Prospect Street, New Haven, Conn.
 WHITTEN, ROBERT HARVEY, State Library, Albany, N. Y.
 WICKER, GEORGE RAY, Dartmouth College, 30 N. Main Street, Hanover, N. H.
 WILCOX, DELOS FRANKLIN, Author, Elk Rapids, Mich.
 WILGUS, JAMES ALVA, Platteville, Wis.
 WILLARD, NORMAN P., 1532 Marquette Building, Chicago, Ill.
 WILLCOX, WALTER FRANCIS, Prof., Cornell Univ., Ithaca, N. Y.
 WILLETT, ALLAN H., Brown Univ., Providence, R. I.
 †WILLIAMS COLLEGE, Williamstown, Mass.
 WILLIAMS, G. C. F., Hartford, Conn.
 WILLIAMS, HARVEY LADEW, Box 410, Bristol, Tenn.
 WILLIAMS, TALCOTT, 916 Pine Street, Philadelphia, Pa.
 *WILLIAMS, TIMOTHY SHALER, 913 Union Street, Brooklyn, N. Y.
 WILLIS, HENRY PARKER, Prof., Washington and Lee Univ., Lexington, W. Va.

- WILLOUGHBY, WILLIAM FRANKLIN, U. S. Department of Labor,
Washington, D. C.
- WILLOUGHBY, W. W., Johns Hopkins Univ., Baltimore, Md.
- WILSON, GEORGE GRAFTON, Prof., Brown Univ., Providence, R. I.
- WILSON, THOMAS, The Aberdeen, St. Paul, Minn.
- WILSON, WOODROW, Pres., Princeton Univ., Princeton, N. J.
- *WINSLOW, WILLIAM COPLEY, 525 Beacon Street, Boston, Mass.
- WINSTON, AMBROSE PARÉ, Washington Univ., St. Louis, Mo.
- WOOD, FREDERICK A., 295 Pawtucket Street, Lowell, Mass.
- WOOD, STUART, 400 Chestnut Street, Philadelphia, Pa.
- *WOODFORD, ARTHUR BURNHAM, Prof., "Oak Hill," 469 Whalley
Avenue, New Haven, Conn.
- WOODRUFF, CLINTON ROGERS, 818-819 Girard Building, Philadel-
phia, Pa.
- WOODWARD, P. H., Conn. Gen. Life Ins. Co., Hartford, Conn.
- WOOLWORTH, JAMES MILLS, Omaha, Neb.
- †WORCESTER FREE PUBLIC LIBRARY, Worcester, Mass.
- *WORTHINGTON, T. K., *The Daily News*, Baltimore, Md.
- WRIGHT, CARROLL DAVIDSON, United States Commissioner of Labor,
Washington, D. C.
- WYCKOFF, WALTER AUGUSTUS, Prof., Princeton Univ., Princeton,
N. J.
- †WYOMING, UNIVERSITY, Laramie, Wyom.
- YARROS, VICTOR S., 608 E. Division St., Lincoln Park Station,
Chicago, Ill.
- †Y. M. C. A. LIBRARY, 317 W. 56th Street, New York City.
- YOUNG, ALLYN A., Asst. Prof., Adelbert College, Cleveland, O.
- YOUNG, FREDERICK G., Prof., Eugene, Oregon.
- YOUNG, JOHN P., *Chronicle* Office, San Francisco, Cal.
- ZACHRY, JAMES G., 1038 Fifth Avenue, New York City.
-

SUMMARY OF MEMBERSHIP—FEBRUARY 1, 1904.

Honorary members	13
Life members	75
Annual members	751
Subscribers	148
Total	987

GEOGRAPHICAL DISTRIBUTION OF MEMBERS AND SUBSCRIBERS.

Alabama	3	Michigan	26	Vermont	6
Arizona	1	Minnesota	18	Virginia	2
Arkansas	1	Mississippi	1	Washington	11
California	29	Missouri	26	West Virginia	5
Colorado	6	Montana	4	Wisconsin	32
Connecticut	33	Nebraska	14	Wyoming	2
Dist. of Columbia	57	New Hampshire	5	Philippine Islands	1
Florida	1	New Jersey	20	Porto Rico	1
Georgia	1	New York	205		
Idaho	1	North Carolina	7	Japan	14
Illinois	61	North Dakota	2	Great Britain and	
Indiana	16	Ohio	45	Ireland	13
Iowa	15	Oklahoma	2	Canada	10
Kansas	4	Oregon	6	France	6
Kentucky	6	Pennsylvania	63	Germany	6
Louisiana	9	Rhode Island	12	Other foreign	
Maine	7	South Dakota	3	countries	15
Maryland	31	Tennessee	5		
Massachusetts	109	Texas	8	Total	987

SUMMARY.

	1901	1902	1903	1904
North Atlantic States	357	434	463	460
South Atlantic States	79	107	109	104
North Central States	233	279	289	262
South Central States	18	23	23	35
Western States	55	63	62	60
Foreign	60	61	62	66
Total	802	965	1008	987

THE SIXTEENTH ANNUAL MEETING

The Sixteenth Annual Meeting of the American Economic Association was held at New Orleans, La., December 29 to 31, 1903. The American Historical Association met at the same time and place, and two joint sessions of the two Associations were held. A special train starting from New York brought 105 persons, a large party came in special cars from Chicago, and several smaller parties came from the South and West.

The program as carried out was as follows:

PROGRAM

First Session—Tuesday, December 29, 10 A. M.

Division A, Court Room, Civil District Court, Jackson Square.

SOUTHERN AGRICULTURAL PROBLEMS.

1. Tobacco. LAWSON H. SHELPER, of Nacogdoches, Tex., Tobacco Expert of the United States Department of Agriculture.
2. Discussion by J. B. KILLEBREW, Expert on Tobacco for the Census of 1880, Nashville, Tenn.
3. Sugar. WILLIAM C. STUBBS, of Baton Rouge, La., Director of the Louisiana Sugar Experiment Stations.
4. Discussion by JOHN DYMOND of Belair, La.
5. Rice. S. A. KNAPP, of Lake Charles, La., President of the Rice Association of America.
6. Discussion by S. LOCKE BREAUX, of New Orleans, Vice-President of the Rice Association of America.
7. Cotton and the General Agricultural Outlook. D. F. HOUSTON, President of the Agricultural and Mechanical College of Texas, College Station, Texas.
8. Discussion by GEORGE K. HOLMES, Department of Agriculture, Washington, D. C.

Tuesday, 1 P. M., Creole luncheon given to members by the Louisiana Historical Society, at the Cabildo, Jackson Square.

Second Session—Tuesday, December 29, 2.30 P. M.

Louisiana Supreme Court Room, Cabildo, Jackson Square.

INDUSTRIAL PROBLEMS OF THE SOUTH.

1. The Cotton Industry. D. A. TOMPKINS, of Charlotte, N. C.
2. Discussion by CHARLES C. THACH, President of the Alabama Polytechnic Institute, Auburn, Ala.
3. The Utilization of Southern Wastes. RICHARD H. EDMONDS, Editor of the *Manufacturers' Record*, Baltimore, Md.
4. Discussion by STUART WOOD, of Philadelphia.

Third Session—Tuesday, December 29, 8 P. M.

Newcomb College, Washington Avenue, corner Chestnut Street.

JOINT SESSION WITH THE AMERICAN HISTORICAL ASSOCIATION.

1. Address of Welcome, by EDWIN A. ALDERMAN, President of Tulane University.
2. Social Aspects of Economic Law. Address, by EDWIN R. A. SELIGMAN, Columbia University, President of the American Economic Association.
3. Ethical Values in History. Address by HENRY C. LEA, President of the American Historical Association.

Fourth Session—Wednesday, December 30, 10 A. M.

Tulane University Library.

ECONOMIC THEORY.

1. The Relations between Rent and Interest. FRANK A. FETTER, Cornell University. (The opening paper read by title only.)
2. Discussion by THOMAS N. CARVER, Harvard University; J. H. HOLLANDER, Johns Hopkins University; CHARLES W. MCFARLANE, Philadelphia, Pa.; LINDLEY M. KEASBEY, Bryn Mawr College; WILLIAM G. LANGWORTHY TAYLOR, University of Nebraska; ALBERT C. WHITAKER, Leland Stanford Junior University.

1 P. M., at Tulane University, luncheon given by friends of the Association in New Orleans. 4 P. M. meeting of the Council, and of those interested in the projected Political Science Association. Reception at the home of Mrs. T. G. Richardson, 4 to 6 P. M.

Fifth Session—Wednesday, December 30, 8 P. M.

Banquet Hall of New St. Charles Hotel.

CORPORATE AND PUBLIC FINANCE.

1. The Management of the Surplus Reserve. EDWARD S. MEADE, University of Pennsylvania.

2. Discussion by JOHN H. GRAY, Northwestern University; HENRY R. HATFIELD, Chicago University.
 3. The Theory of Loan Credit in Relation to Corporation Economics. J. PRASE NORTON, Yale University.
 4. Discussion by FREDERICK A. CLEVELAND, New York University.
 5. State Taxation of Interstate Commerce. F. J. GOODNOW, Columbia University.
 6. Discussion by WINTHROP M. DANIELS, Princeton University; CARL C. PLEHN, University of California.
- After the session, smoker at the Round Table Club.

Sixth Session—Thursday, December 31, 10 A. M.

Tulane University Library.

THE TRUST PROBLEM.

1. Trusts. HENRY C. ADAMS, University of Michigan.
 2. Discussion by HENRY C. EMERY, Yale University; BALTHASAR H. MEYER, University of Wisconsin; JAMES E. LEROSIGNOL, University of Denver; EDWARD W. BEMIS, of Cleveland, O.; MAURICE H. ROBINSON, University of Illinois; summary of discussion by HENRY W. FARNAM, Yale University.
- 2 P. M., a walk in the Vieux Carré.

Seventh Session—Thursday, December 31, 8 P. M.

Gibson Hall, Tulane University.

SECOND JOINT SESSION WITH THE AMERICAN HISTORICAL ASSOCIATION.

1. A Theory of Social Causation. FRANKLIN H. GIDDINGS, Columbia University.
2. Discussion by ALBION W. SMALL, Chicago University; CHARLES H. COOLEY, University of Michigan; LESTER F. WARD, Smithsonian Institution; of the American Economic Association; and E. EMERTON, Harvard University; GEORGE L. BURR, Cornell University; WILLIS M. WEST, University of Minnesota; of the American Historical Association.

9.30 P. M., reception at Tulane University, by President Alderman and the Faculty of Tulane University.

Friday, Jan. 1, 9.30 A. M. Excursion on the Mississippi, with stops at Chalmette, near the battle-field of New Orleans, and at a sugar plantation.

COUNCIL MEETING

The Council met Wednesday, December 30th, 1903, at 2:45 P. M., in the Library of Tulane University, President Seligman being in the chair. The Secretary's report was read and accepted. It is as follows:

REPORT OF THE SECRETARY TO THE COUNCIL OF THE AMERICAN ECONOMIC ASSOCIATION.

DECEMBER, 1903.

Three meetings of the Executive Committee have been held during the current year. At the first, held at the close of the last annual meeting, a preliminary discussion was given to the various subjects referred to the committee, and the Treasurer was authorized to place the surplus of the Association where it would draw interest. Acting on this authority, the Treasurer arranged with the bank whereby interest at $3\frac{1}{2}\%$ has been paid on \$1,500 during the current year.

At the meetings held on the call of the President, April 25th and November 27th in New York City, were considered the various subjects that had been referred to the Executive Committee. At the spring meeting a conference was held with representatives of the committee having in charge the subject of a new Political Science Association or of some means of fuller consideration of questions of political science in the meetings of the Economic and Historical Associations. As a result of this discussion, a time has been set aside at this meeting for the consideration of this subject.

The question of publication policy was debated at length at both meetings. It was agreed that a merely

popular publication was not practicable, and that a popular magazine was not desirable. A number of possible amendments of the present publication program were submitted by the members of the committee and some of them will be suggested to the Council as worthy of consideration. The Secretary was instructed to ask the existing Journals whether they would make a special club rate to the members of this Association.

The coöperation of this Association with the Carnegie Institute was furthered by the action of a sub committee and particularly by the efforts of President Seligman. The members of the Council received inquiries regarding their choice of committee heads for the work in economic history of the United States contemplated by the Carnegie Institute. On the basis of this vote, the results of which were compiled, recommendations were made to the committee of the Carnegie Institute which were substantially adopted.

The following recommendations are made by the Executive Committee to the Council:

- (1) That to provide for work in bibliography and economic legislation the Council appropriate not to exceed \$500 a year to be put at the disposal of the Publication Committee;
- (2) That the Publication Committee be authorized in its discretion to publish as separate numbers any portions of the annual proceedings;
- (3) That the Association issue annually a list of doctors' theses in process of writing in American Universities;
- (4) That the ex-Presidents of the Association be continued as life members of the Executive Committee, provided that they be not counted in the number necessary to a quorum;

(5) That the plan be continued that has been followed in the past two years of having the Executive Committee act as a committee on time and place of meeting in consultation with a similar committee of the American Historical Association, reporting its recommendations a year in advance to the Council at the regular annual meeting.

A sub-committee was appointed to confer with a committee of the American Historical Association with reference to the next meeting place, and that committee's report will be presented at this meeting.

The standing committees on the Economic Condition of the Negro, and on Index Numbers have reported progress, but neither was prepared to submit a formal report through the Secretary at this time. Doubtless they will have something to present to the Council.

During the present year 6 members of the Association died, 1 being a life member; 47 resigned; 8 were dropped for non-payment of dues; the total loss of members was 61, and of subscribers was 4. Since the last report there have been added 36 members (one of them being a life member) and 8 subscribers. The net loss of members is 21; net gain of subscribers is 4; the total net loss being 17. At the date of this report there are 994 members, a few less than a year ago. This number doubtless can be increased by another effort such as has been made in the past. Certainly the influence of, and the interest in, the Association has suffered no decline in the past year.

The publications have been issued with greater regularity than for several years past. The fourth number was delayed in a number of unavoidable ways as it went through the press, but is now being mailed to the members. The Publication Committee has furnished the

manuscript promptly and deserves the gratitude of the Secretary and the congratulations of the Association for its exceptional record. The total number of pages published this year is 986, several hundred fewer than in preceding years. There is reason to think that the Association's usefulness will be fully as great if it limits its publication in bulk and concentrates its efforts on increasing the quality and usefulness of its output.

The Treasurer's account shows a balance of \$3,040.10 which is an increase of eight hundred dollars over that of any previous report, although five printing bills have been paid during the current year.

Very respectfully submitted,

FRANK A. FETTER.

TREASURER'S REPORT.

FRANK A. FETTER, Treas.

*In account with the American Economic Association
for the year ending December 24, 1903.*

Debits.

Cash on hand at date of last report.....	\$2,188 92
Sales and subscriptions—	
The Macmillan Co.....	\$837 93
Secretary's office.....	349 32
Swan Sonnenschein.....	40 38
Reprints.....	52 70
Life member.....	50 00
Annual dues.....	1,979 20
Interest.....	26 25

Credits.

Expense of publications.....	\$1,803 76
Expense of President's office.....	212 86
Expense of Sec. and Treas. office.....	307 70
Expense of meetings—	
Fifteenth Annual Meeting.....	\$85 28
Sixteenth Annual Meeting (part) 75 00	160 28
Balance in cash.....	3,040 10
	<hr/>
	\$5,524 70 \$5,524 70

The President appointed as a committee to audit the report of the Treasurer, Messrs. B. H. Meyer and Jesse E. Pope.

J. H. Hollander reported in behalf of the committee on time and place in favor of a meeting in Chicago in December, 1904, with the expectation that the meeting might be held in Washington and Baltimore in 1905. By invitation of the Council, Albion W. Small addressed the body with reference to the meeting in Chicago. On motion of Stuart Wood the report of the committee was accepted.

The President read a letter from Carroll D. Wright, a trustee of the Carnegie Institute, in reference to the contemplated work in economic history. The Secretary was instructed to forward to the Carnegie Institute the following resolution: "*Resolved*, That the Council of the American Economic Association desires to express its cordial recognition of the liberal action of the Carnegie Institute in providing for research in American economic history, and tenders its hearty coöperation in the same as opportunity may arise." It was moved and carried that paragraph 2 of article 6 of the constitution be amended so as to include the former Presidents of the Association as life members of the Executive Committee, provided that a quorum shall consist of four out of the seven elected officers.

It was voted to continue the plan of having the Executive Committee act as a committee on time and place of meeting in consultation with a similar committee of the American Historical Association, reporting its recommendations a year in advance to the Council at the regular annual meeting.

It was voted that to provide for work in bibliography

and economic legislation the Council appropriate not to exceed \$500 a year to be put at the disposal of the Publication Committee. That committee, however, before taking action, is to secure the approval of the Executive Committee.

It was voted that the Publication Committee be authorized in its discretion to publish as separate numbers any portions of the annual proceedings.

It was voted that the chairman of the Publication Committee make a report at the next annual meeting outlining a plan of future publication activity.

It was voted that the resolution that the Association issue annually a list of doctors' theses in process of writing in American Universities be referred to the Executive Committee with power to act.

The report of the Nominating Committee, made by its chairman, Richard T. Ely, was as follows: President, Frank W. Taussig; Vice-Presidents, Irving Fisher, John W. Gray and John Graham Brooks; Secretary and Treasurer, Frank A. Fetter. Elected members of the Executive Committee, W. M. Daniels, Henry B. Gardner and W. Z. Ripley. Members of the Publication Committee, David Kinley, Henry R. Seager. By unanimous vote the Secretary was authorized to cast a single ballot for the names recommended by the committee.

The members of the Council whose terms expire in 1904 were renominated, but as the committee was not prepared to report nominations for new members of the Council, it was authorized to report later to the Executive Committee. In accordance with this authority the following new names were added to the Council: Walter E. Clark, Frederick A. Cleveland, Katharine A.

Coman, George M. Fisk, Henry R. Hatfield, James E. LeRossignol, Albion W. Small, E. N. Tuckey, Albert C. Whitaker.

It was moved by L. M. Keasby, on behalf of the Nominating Committee, that the Secretary be provided with an assistant with a salary to be fixed by the Executive Committee. Carried.

A letter was read from the Census Bureau asking the coöperation of the Economic Association, especially on the question of financial statistics.

It was voted that the chair appoint a committee of ten or more on municipal accounting and finance, and by amendment the chair (Mr. Seligman) was made a member of the committee.

In pursuance of this resolution the committee was constituted as follows: F. A. Cleveland, chairman; F. R. Clow, W. M. Daniels, F. A. Fetter, H. B. Gardner, F. J. Goodnow, C. C. Plehn, E. R. A. Seligman, R. H. Whitten.

A committee on resolutions was appointed by the chair. The Council then adjourned.

RESOLUTION

At the last joint session of the two Associations, on the motion of Stuart Wood, the following was unanimously adopted:

Resolved, That the American Historical Association and the American Economic Association tender to their friends in New Orleans most heartfelt thanks for the many graceful and kindly courtesies during the period

of the meeting in this city—a meeting which will always have an especial place in the memory of the visitors as a time of peculiar pleasure and interest.

And in particular they desire to express their appreciation of the generous attentions and entertainment extended to them by Tulane University and by its President and Faculty, and by Newcomb College, the Civil District Court, the Louisiana Historical Society, the Round Table Club, by Mrs. T. G. Richardson, Mrs. William Preston Johnson, Messrs. W. G. Wilmot & Co., Mr. T. P. Thompson, and Professors Ficklen, Aldrich and Fortier, of Tulane University.

PAPERS AND DISCUSSIONS

SOCIAL ASPECTS OF ECONOMIC LAW

PRESIDENTIAL ADDRESS BY EDWIN R. A. SELIGMAN

In the address which I had the honor to deliver on this presidential platform last year, attention was directed to the relation between economics and social progress. The effort was made more particularly to estimate the weight to be attached to the influence of economic forces upon social life, and to the effect of economic doctrines on social speculation. This year we shall, with your leave, look at the reverse of the shield, and endeavor to study some of the social aspects of economic facts and theories. In lieu of centering our gaze upon the narrow, although stable, economic foundation of social thought and social institutions, let us direct our view to the broad, but deep, social basis of economic principle and economic fact. Last year we studied some of the economic aspects of social law; this year we shall study some of the social aspects of economic law.

Such a course seems to require some justification. Why weary us with an old story, it will be said? Why reiterate a thrice told tale? Do we not know that the economic life is a part of the wider social life? Are we not fully aware of the fact that economics is a social science, and that every economic theory is in large part social in character? Do we not realize, quite adequately, the social imprint upon every economic fact?

In reply to such objections, I have to answer this:

We grasp the form, but not the substance. We think that we appreciate the social basis of economic law, but in reality our appreciation is fragmentary. We do the theory lip-service, but not brain-homage. We are oblivious of its real significance. Because of this, in some of the basic questions of economic theory there are discord and confusion, where there should be harmony. Because of this, in some of the most important questions of applied economics, we are floundering about, tossed on the stormy sea of doubt without rudder or compass. Because of this, some of the current and seemingly fundamental doctrines of public finance are in reality erroneous, or at least impotent to explain modern tendencies or to afford any satisfactory clue to the solution of modern difficulties. By their fruits shall ye know them!

This is a severe and comprehensive indictment. You will accordingly expect me to substantiate these charges, at least so far as it is possible to do so within the limits of a single address.

The contrast between the social and the individual point of view has recently been made familiar to us in allied domains. Take, for instance, the whole range of ethical inquiry. Without entering at all upon the deeper problems of transcendental origins and supra-mundane sanctions, and limiting ourselves to a consideration of human development, it is now substantially conceded, or at least coming more and more to be recognized, that private ethics is an outgrowth of social ethics, that the morality of the individual has been fashioned by the morality of the social group, and that the very conception of right and wrong, so far as it is of human origin at all, is the product of social, not of individual, forces. The weakness of the early utilitarian

theory is to be sought not in the fact that it propounded a hedonistic explanation of morality, but in that it placed itself upon the narrow ground of individual utility rather than upon the broad foundation of social utility.

Our concern, however, is with economic, rather than with ethical, forces; and in the economic field we have ample and palpable proof of the short comings of the individual point of view, in history and in theory alike.

Take, for instance, Adam Smith's account of the essential principle of economic progress. You remember that Adam Smith finds the explanation in the division of labor, and thinks that this is the result of a certain trait in human nature, "the propensity to truck, barter, and exchange one thing for another." This individual propensity is made by Adam Smith the corner stone of his entire edifice of economics. Yet modern research in ethnology has disclosed the undoubted fact that he is quite mistaken. Far from there having been a natural propensity in man to truck and barter, the original propensity was just the reverse. Exchange was at the outset, and for many long centuries, considered not natural, but unnatural; not normal, but abnormal; not economic, but uneconomic; not useful, but reprehensible.

An analysis of the very terms used by Adam Smith shows this clearly enough. To truck is etymologically to trick, to cheat; barter is another form of barrator, and although barratry persists to-day only as a particular kind of crime, its primary meaning was far broader. Exchange was therefore originally deemed a bad thing, a heinous offence, as involving a wrong to the other party.

But, furthermore, we now know with some degree of verisimilitude how barter arose, and how it slowly

changed from a wasteful to an economic process. Recent investigation has disclosed to us the phenomenon of the silent trade, and has made it clear that the earliest forms of exchange were inter-tribal, and not intra-tribal. It was only after the early hordes or clans had worked out the system of joint and collective presents and counterpresents which form the basis of primitive group barter, that the individual members of the clan came to recognize the applicability of a similar system within the group. Private barter is the result of communal barter, individual trade is an outgrowth of social trade. The propensity to truck, far from being a natural and original inclination of the individual, as Adam Smith thought, is a direct product of social forces. It is not antecedent, but consequent.

What is true historically is true analytically. If economics is a science at all, it is a science of values—not of all values indeed, but of economic values. Yet some of the basic discussions of economic theory are still beclouded by the inability to distinguish the social character of value. The favorite study of Robinson Crusoe, who figures so prominently in the older treatises, is indeed still useful as affording an illustration of the psychology underlying all individual choices; but the attempt to apply these conclusions directly to modern economic problems is fraught with peril, because the economic life of to-day rests not on Robinson Crusoe conditions, but on social conditions. I have elsewhere called attention to the fact that the contest still raging between the partisans of the cost theory and of the utility theory of value is at bottom based on a misconception, and with your permission I shall spend just a moment in recalling this rather technical point to your minds.

When we say, correctly enough, that value¹ is the expression of utility, we really mean that it is the expression of social marginal utility. While social utility indeed is made up of a combination of individual utilities—that is, while a thing cannot be useful to society unless it is useful to the individuals who compose the social group, the marginal utility that controls value is the reflection of the social marginal utility. Even though a pound of iron may at a given moment conceivably be of more direct use to an individual than a pound of diamonds, a pound of iron does not satisfy as many, or as urgent, social wants as a pound of diamonds. Iron is less valuable than diamonds because its social marginal utility is less. In the same way, when we say that value depends on cost, we refer really to social, not to individual, cost. The street sweeper may work harder than an opera singer, yet the value of his services will be less. It may cost me five days to make a table that the factory will turn out in five hours, yet my table will not sell for more. The marginal cost around which values gravitate is not individual cost, but social cost. The value of a commodity is due not to the labor of the individual who has made it, but to the social service which it is going to render, that is, to the social sacrifice which it is going to save. When we say that individual cost of production fixes value, we really mean that it expresses the value that is fixed by social forces as a whole.

The failure to recognize the essential equivalence of marginal utility and marginal cost is due to the neglect of this social element. It is true indeed that in modern life there is no such equivalence for the individual considered as such; and this has led most thinkers astray. If a knife ordinarily exchanges for a book, to any one

¹ "The Social Elements in Value," *Quarterly Journal of Economics*, vol. XV, 1901.

individual the pleasure may still be less than the sacrifice, and to his neighbor the sacrifice may be less than the pleasure. I may like a cow more than a horse, or I may be able to raise a particular horse for less than a particular cow; but that will not enable me to buy horses in the market for less than cows. The balance or equilibrium is not between the pain and the pleasure of the individual, but between the pain and the pleasure of the group. Individual utility is indeed not equal to individual cost; but social marginal utility must everywhere be equivalent to social marginal cost. The idea that there is an inevitable opposition between the cost theory and the utility theory of value rests on the failure to discern its social basis.

Let us look at some of the consequences of this failure. The classical economists thought that they had hit upon an important truth in differentiating the theory of international trade from that of domestic trade. As finally developed by Cairnes, the theory of international trade rests on an acute analysis of reciprocal demand and reciprocal cost in the sense of comparative social sacrifice. But Cairnes, like Ricardo and Mill before him, did not see that the same analysis is applicable to all trade, that is to all value, because in internal, as well as in international, commerce the controlling considerations are social, and not individual in character. It must therefore not surprise us to find that only the other day the gifted Prime Minister of England issued a noteworthy pronouncement on the tariff agitation, in which he employed as one of the fundamental premises of the argument for protection, or rather for retaliation, precisely this unreal distinction between the theory of international and the theory of internal trade.¹ When we reflect on the weight

¹ *Economic Notes on Insular Free Trade*. By the Rt. Hon. Arthur James Balfour. 1903. p. 5.

to be attached to this ministerial manifesto in the politics of a great nation, must we not recognize the important consequences of such an error in theory.

I do not wish to be understood as intimating that because one of the premises happens to be unfortunately chosen, the conclusion cannot be defended on other grounds. On the contrary, the relation between the individual and the social elements of economics has often been inadequately expounded by the free traders, no less than by the protectionists. Adam Smith himself seems to realize that the collective interests are paramount, when he seeks to unfold the principles of the *Wealth of Nations*, but he identifies the social with the individual interests when subject to the unimpeded action of natural law. The Mercantilists of old based their demands for extreme protection on the mistaken theory of balance of trade—mistaken, because it confused the collective economy with the private economy—because it assumed that a country, like an individual, must have a surplus money income. But the Free Traders went to an opposite extreme when they identified the social with the individual interest and claimed that if only individual action be unfettered and if free scope be given to the principle of self-interest the results are bound to be beneficent for the group as well.

Another illustration of the tangle of thought into which we are plunged by the failure to realize the social implication of economic law is to be found in the theory of private property. We have been taught that our modern age is immeasurably superior to that of classic antiquity, and as a typical proof we are referred to the progress in the theory of property. The Roman doctrine of private property was that of occupation, and is no doubt to be explained in large measure by the facts

in the development of Roman life. On the other hand, the theory as elaborated by the philosophers, and tacitly accepted by the people, of recent centuries is the labor theory. We pride ourselves on the advance that has been made. The Romans seized their property, so it is said; we earn our property: the one is a brutal doctrine; the other a moral doctrine.

And yet, half uneasily, half regretfully, we are beginning to realize that things are not quite so simple; that the labor theory does not exactly fit into the facts of modern life. In truth, the labor theory, like the occupation theory, is deficient because it looks at the individual, instead of the social, element. Take for example our modern problem of irrigation. The English common law conception of private property—the property that reaches, as has been drastically said, from heaven to hell—is a product of a moist climate—of conditions where there is an abundance—nay, even a superabundance—of water, and where private interest could be safely depended upon to give the best results. But in the arid and semi-arid regions of our western empire, neither occupation nor labor is deemed to give an equitable title to the river or the adjacent riparian lands. The new code of private property which is springing up in the West is one in which the individual rights are clearly and forcibly held subservient to those of the community.

What is true of irrigable land in the West is true in varying degree of many forms of private property in the East. "May I not do as it listeth me with my own," is a cry far less frequently heard than of old. Private property as a concept will no doubt always remain with us; but the content of the concept is changing and has changed from the beginning of civilization. Property

in slaves was at one time considered economically advantageous and morally defensible. Private ownership of the highways was not so long ago usual and justifiable. In the city of New York to-day the process of the extinction of private property in docks is fast going on. If, as Carlyle tells us, no one believes what his grandfather believed, we may almost say no man owns what his grandfather has owned. Moreover, not only do we no longer own the same things, but even where this is the case, we do not own them in precisely the same way. What phrases are more common to-day than the obligation of wealth—the public trusteeship of property, and the like. How long will it be before we tread the same path that has been opened up in the fiscal domain, where voluntary contributions have become transmuted into compulsory payments, and where the moral duty is now converted into a legal obligation. With the advance of society the individual element in the justification and in the content of private property recedes, and the social element comes to the fore.

Another application of the same principle may be seen in the controversy that is agitating all parts of our country to-day—the labor question, with the problem of trade-unionism and the open shop. If there were time, it would be profitable to dwell upon this thought—that while there is indeed only too much truth in the contention that many of our unions are steering perilously close to the rocks of monopoly and extortion, the problem cannot be solved simply by emphasizing the right of the individual laborer. The right of the individual to work is indeed, as Turgot told us over a century ago, a sacred and imprescriptible right; but the conditions under which this right is to be exercised are by no means a matter of mere individual discretion and of social unconcern. We

are beginning to see that the securest guarantee of liberty is the social sanction—that true and permanent freedom is at bottom an outgrowth of social forces, and that individual bargaining results in a mere empty husk of freedom. Liberty—to quote Carlyle again—is a divine thing; the liberty to die by starvation is not so divine. If this is true, then the real sacredness and imprescriptibility attach to that wise and collective action which will secure a higher and more effective liberty for the members of the group, and which it goes without saying must be so devised as not to close the door of opportunity to either the unfortunate or the peculiarly gifted. To magnify the individual at the expense of the social group is to close our eyes to the real forces that have elaborated modern liberty and modern democracy, not in the backwoods of a frontier community but in the busy marts of commerce and the complex home of industry.

But however tempting the pursuit of this line of inquiry would be, I must pass it by in order to reach what is in some respects a still more important illustration. This is to be found in the domain of public finance. Partly for this reason, and partly because the questions of public finance have never been touched upon by any of my predecessors in their presidential addresses, I venture to deal with this part of the subject at greater length.

The point I have in mind is concerned with a fundamental problem in taxation. In the ordinary manuals we find the chief emphasis put on the principles of uniformity and universality of taxation. The study of distributive justice, in its economic foundations, has long been the storm center of scientific fiscal controversy. Whether with the older writers we advocate the doctrine

that men should be called upon to discharge their obligations to government in accordance with the benefit they receive from it—or whether with the newer writers we accept the doctrine that taxes should be levied in proportion to the ability of the tax-payer—in both cases alike the starting point and the goal of the discussion is the individual. This of course does not mean that these doctrines equally rest upon what might be called the atomic doctrine of the state. On the contrary, it is a matter of common knowledge that while the benefit theorists accept that conception of government which has been described as “anarchy plus the policeman” the faculty theorists on the contrary count in their ranks the advocates of radical social reform and even most of the socialists themselves.

The point that it is desired to emphasize, however, is that both schools are individualistic in the sense that their conception of justice in taxation revolves about the burden resting on the original individual who pays the taxes, and disregards the subtler consequences of the economic law that governs the transaction. Just as the benefit theorists think only of the advantages accruing to the individual, so the faculty theorists are primarily concerned with the problem of equal sacrifice as between individuals, with the exemption of the individual minimum of subsistence, and with the scheme of graduated taxation as between individuals. They, like the others, have in mind first and foremost the individual.

Now, there are two remarkable facts connected with this modern development of fiscal theory. In the first place, every American investigator cannot but be struck with the discrepancy in our text books between the theories and the application of the theories. My distinguished predecessor in this presidential chair, Professor

Henry C. Adams, will I trust not think that any betrayal of confidence is involved when I recall his statement that the great difficulty with which he had to contend, when writing his admirable work on the Science of Finance, was the well-nigh insuperable task of making his conclusions, drawn from the theory of ability, of any practical avail when dealing with our specific problems. And if we could analyze the thought of many members of this audience, I am confident that my distinguished predecessor is not by any means the only one who has been forcibly struck by this fact. The theoretical conclusions all seem to point one way, and the possibility of practical application the other. In fact, if I may be pardoned for sounding a personal note, it was this yawning gulf, this gaping hiatus between theory and application which prevented me from publishing several years ago the results of a protracted study on the Income Tax. I did not then understand that the difficulty is far more deep-rooted, and that the disparity is due not to any doctrine of faculty, but to the underlying individual basis of the accepted theory of finance.

Not only are the conclusions of the generally received doctrine inapplicable to our condition, but—and here we come to the second remarkable fact—the recent history of American taxation seems to be in flat contradiction to the very foundations of the theory. Equality and universality of taxation are accepted as the corner-stones of the faculty theory. How then shall we explain the indubitable fact that our general property tax is disappearing, that personalty is slipping out of the assessment lists, and that in all our great industrial centers at least, real estate has come to bear well nigh the exclusive burden. Where are the equality and the universality of that practice? How shall we explain the fact that while

indirect taxation is theoretically opposed to the doctrine of equality, in the country as a whole the revenue from indirect taxation is a continually increasing proportion of the total income. And if it is claimed that at all events our modern taxation of corporations is a step in the direction of greater equality, do you not see that the real tax-payers are not these fictitious entities which are called corporations, but the human beings that compose them? Taxation of the corporation is not taxation of the individual security holder, for the majority of the securities in great classes of our corporations are in the hands of the bond-holders who are not touched by the tax; since in every solvent corporation the payment of the stipulated interest is deemed a fixed charge, taking precedence of the payment of taxes. Wherever we turn the facts seem to give the lie to the doctrine of ability.

What is the explanation of this curious state of affairs? Are we really going to the bad? Have we lost our grip on the cardinal principles of justice? Or is the fault to be ascribed to the theory rather than to the facts. And if so, where shall we look for its weakness, and what is the new doctrine that is capable of interpreting the facts, and of clearing up the mist in which the whole subject is enshrouded.

To these queries I would answer: our American development is based not on injustice, but on justice; it is moving in the right, not in the wrong direction; it is in accord with, not in opposition to, the real economic law. If the current theory does not harmonize with the facts, so much the worse for the theory. In truth we have been living in a fool's paradise. We have accepted from the European writers, and have developed with wearisome iteration, a doctrine which is not only in flat con-

tradition to our American phenomena, but which if they were carefully analyzed, would be seen to be in almost equal opposition to the facts of European life. We base our theory of taxation on an explanation which does not explain. It is high time that we should emancipate ourselves from this foolish fetichism.

A few writers have indeed felt that there was something wrong, but have been unable to locate the real point of weakness. McCulloch, for instance, several decades ago, confessed that according to the accepted theory the income tax is ideal; but with the sound common sense of an Englishman he sturdily maintained that in practice the income tax is a fraud, and he contended that indirect taxes were therefore indispensable. Hence his conclusion that equality of taxation cannot be attained, and that what is right must give way to what is expedient and practicable—truly a lamentable conclusion. More recently Mr. Edwin Cannan stated that "economy plays and should play a much greater part, and equity a much smaller part, in schemes of taxation than is commonly supposed." If this were true we might as well abandon the notion that at bottom there is an essential correlation between economic and moral law, we might as well relinquish the belief, so deeply cherished by some of us, that in the long run the true economic welfare of a community is identical with its abiding ethical interests.

But it is not true, and the failure to detect the truth, the inability to perceive the real cause of the clash between the theory and the practice is ascribable to the fact that we have put the emphasis upon the individual, rather than upon the social, aspect of economic law. Let me make my meaning clear.

When we speak of the burdens of taxation, we ordin-

arily think of the individual—of the burden upon one man as compared with that upon his neighbor. For in last resort it is always the individual who pays, either by dipping his hand into his own pocket, or by suffering a diminution in the revenue which he would enjoy if there were no tax. On this assumption we proceed to elaborate our highly wrought theories of fiscal equity. Thus we say that taxes should be proportional or progressive, that equality means relative equality as between individuals in the community, and that the real sacrifice imposed upon one man should not differ from that imposed upon his neighbor.

It is indeed true that writers on finance have been cognizant of the fact that not all taxes are borne by those that pay them in first instance. A chapter or two on the shifting and incidence of taxation is to be found in almost every treatise. But for the most part the distinction has been between direct and indirect taxes; and in the case of the indirect taxes, which are shifted to the final consumer, it has usually been thought that there is no room for any application of the doctrine of ability and sacrifice. To this is to be ascribed, in part at least, the effort of modern fiscal reformers to diminish the scope of indirect taxes.

But here we have a remarkable situation. It is conceded that when we tax the individual owner of a commodity which is subsequently disposed of by purchase and sale we must regard the economic law governing the transaction and study the consequences which affect other individuals, *i.e.*, the social results. If, however, the owner of the article does not dispose of it directly, but uses it to secure a revenue with which he then parts, we call it by some hocus pocus a tax on property, not a tax on commodities; and we shut our eyes to the

essentially identical process of economic law. If we sell the sheep in the market, the tax, so it is said, is indirect; if we keep the sheep on the farm, and sell only the wool, we term it a direct or property tax. If a real estate broker deals in land, the tax on the land as it goes through his hands is an indirect tax, and presumably outside of the realm of ability; if he purchases the land, and sells the wheat, the tax is a direct tax, and to be judged by the principle of sacrifice.

This is far more than a mere question of nomenclature. In the one case we follow the working out of economic law through alterations in values; in the other case we assume that there are no such changes. In the one case we regard the social elements in the problem; in the other, we keep our eyes fixed on the individual element. Yet in essence what is the difference? What is the magic which transmutes a commodity into something different from a piece of property. A commodity is an economic concept; property is a legal concept: at bottom a particular article is nothing but a form of wealth, and subject to the laws that govern wealth. Yet the core of economic law is the study of the social relations of individuals. The entire distinction between direct and indirect taxes in the sense that in the one case we have to deal with immediate results, and in the other with ulterior consequences—this entire distinction is illusory. In the one case as in the other the conspicuous fact is the social process.

It must indeed not be forgotten that some writers have in part apprehended this, and have endeavored to elaborate a universal law of fiscal causation. Adam Smith and Ricardo were on the right track but their efforts were largely frustrated by the fact that they centered their attention upon the shares in distribution;

whereas in actual life we cannot reduce our bewildering variety of imposts to the simple categories of taxes on wages, rent and profits. Canard and his slender band of followers went a step further in boldly proclaiming the law of the general diffusion of taxes. But their exposition failed to command assent because they overshot the mark and overlooked the obvious cases where there is no shifting at all. As a consequence, modern theory has proceeded on the assumption that direct taxes at least tend to stay where they are put, and that the ideals of distributive justice are to be attained by an equitable apportionment of such direct charges on the individuals.

It is high time that we realize the fallacy underlying this assumption. As a matter of fact our complex modern industrial society has rendered necessary a transition from the individual to the social point of view, and calls for a study of taxation based on the existence of economic law.

In such a study the two chief factors must be the shifting and the capitalization of taxation. Each of these has been more or less touched upon by previous thinkers, but no effort has yet been made to bring them into harmonious coöperation.

Capitalization is now a familiar conception. If a tax of one per cent is imposed on a corporate five per cent bond, previously selling at par, then if the bonds of other classes of corporations are not taxed the man who buys this bond will pay only \$80 for it; he gets \$5 interest and pays \$1 in taxes, and his net return of \$4 bears the same proportion to \$80 that the former net return of \$5 bore to \$100. In other words, the tax is capitalized into the difference of the market value of the bond, and the new purchaser who advances the money

does not bear the tax. As the original holders gradually sell out, the tax in time comes to rest on no individual at all.

The shifting of a tax is not much more complicated, as a conception at least. If a special levy, for instance, is imposed upon houses and reduces the income of the owner, there will in ordinary circumstances be a cessation in house building until with the progress of population rents rise. But if rents rise, the manufacturer or merchant who occupies the structure will be compelled to charge more for his wares; and if these wares are the raw materials for some other product, the rise will be successively transferred from one operation to another until it loses itself in the prices paid by the ultimate consumer.

Let us now combine these two conceptions. The older doctrine of shifting led to the so-called diffusion theory; the newer doctrine of capitalization leads to what I would call the absorption theory. For in such cases the tax is not diffused, but absorbed. Whether, however, the tax is diffused or absorbed, the burden on the individual who comes to be the permanent owner of property ultimately vanishes. The combination of the diffusion and of the absorption theories of taxation results in what I should like to call the final disappearance theory. That is, in all cases where a man parts with his property or with the produce of his property or his earnings—and in modern economic life this is more and more overwhelmingly the rule,—the tax finally disappears as a permanent burden on the individual on whom it is sought to be imposed; although, of course, it does not disappear in its effects, often unlooked for, on the economic progress of society as a whole, or of the various social classes in particular.

If we apply this doctrine to our problem, we are confronted by this situation. Take a tax on land, for instance. In the case of agricultural land, provided that in practice real estate is the well nigh exclusive, or at least the preponderant form, of property assessed, the tax is either shifted by being added to the price of the product or, where conditions do not allow this, it is capitalized into a lower selling value of the land, and when the land changes hands the new purchaser buys himself free of tax. Thus in the course of time the tax is diffused through capitalization or shifting. In city real estate the same is true; either rents will go up, or prices of lots will go down, and in the end the community as a whole bears the burden.

Again, take personal property. In the case of mortgages it is now fairly well understood that a tax on the man who lends the money does not remain on him, but leads to an increase in the rate of interest, with all kinds of ulterior effects on building operations, and on the general fiscal and economic welfare of society. With personal property invested in corporate securities, the same results arise not only from shifting, but also from capitalization. In the case of the railway bond, mentioned above, the new purchaser does not suffer, but neither does the shipper, provided any dividends at all are earned. But in the case of railway stocks, the depression of market price that would follow the imposition of the tax might result in limiting the investment of new capital to such an extent as to diminish facilities or to raise rates. In the one case we would have capitalization, in the other, shifting. But in neither case would there be any permanent burden on the individual security-holder who purchases after the imposition of the tax.

The same analysis might be applied to all the other forms of taxation. To keep our eyes riveted on the individual taxpayer will only lead us astray.

A new light is thus thrown on the distinction between real and personal taxes. The books tell us that personal taxes are bad because they are inquisitorial. This is undoubtedly true. But tax reformers nevertheless advocate personal taxes, because they think that in this way alone can individual justice be secured. They fail to realize that under modern economic conditions the only kind of a personal tax which can be made to rest on the individual is a poll tax, or a direct consumption tax, both of which all agree in condemning. Under the highly complex competitive conditions of to-day, the general property tax becomes in practice a partial property tax, or a tax on certain kinds of property, irrespective of the question of individual ownership. Under modern conditions a general income tax which is presumed to reach with accuracy the ability of each individual becomes in practice either what the Germans call a *Lug- und Trug System*, a "lie and cheat system," with the burden primarily on the classes unable to pay; or, as in England and her colonies, a series of imposts not on the persons who receive the income, but on the property which yields the income, or on the corporation or the employer who pays the income. In neither case is there any assurance of equivalence between the amount of the tax and the ability of the recipient of the income.

If we recollect that in the ultimate working out of economic law there is no such distinction between real and personal taxes, but that the difference is simply one of administration and not of essence, our attitude to the whole problem is changed and our opinion as to the ethical

superiority of personal to real taxes must be completely modified. The new ideal is a tax on wealth, the old ideal was a tax on the individual who owned the wealth. The new ideal is a tax on the economic process or phenomenon, the old ideal is a tax on the individual subject of the phenomenon. The contrast is striking and profound.

The origin of our present confusion is not far to seek. In the middle ages there was no active competitive life. Land was not commonly bought or sold, corporate securities scarcely existed, and there was well nigh no field for capitalization of taxation. Exemptions were granted to individuals and to classes—not to classes of property, but to classes of individuals owning property, which is a very different thing. Taxes on consumption were so contrived as to fall with crushing severity on the industrious and the worthy. What wonder that the cry went up for justice through individual equality of taxation. And even to-day, in parts of this country where more primitive economic conditions still prevail, there is some saving virtue in a general property tax, as perhaps elsewhere in a general income tax, each considered as a personal obligation. The simpler a community, the weaker are the action and interaction of social economic forces; the more scope is there for the emphasis on the individual factor. But in the more complex society of to-day, the society of competitive capitalism, of mobility of economic agents, of large industry and modern media of communication, the problem is no longer that of the individual, but of the effect of economic law on the various classes of society, on the agencies of production and on the facts of group, rather than individual, consumption. What I have called the disappearance theory of taxation rests on the facts of social production and of group consumption.

What are the conclusions to be drawn from this theory? They can be put succinctly as follows: Under conditions as they already exist in a large part of this country, and as they are fast coming to exist in the remainder, the effort to secure justice in taxation does not imply the need of considering only the individual. It is not necessary to impose a tax on general property, for the same result can be reached by taxing only special classes of property, provided of course that we do not repeat the mediæval error of exempting particular individual owners within each class. It is not requisite to tax all corporations, since it suffices to tax only certain classes of corporations. It is not necessary to tax all incomes, when the same end can be attained by taxing certain specific sources of income. Above all, while we do not need to tax all consumable commodities, as by the general excises of former days, it is equally unnecessary to apply the predicate "just" to direct taxes, and to withhold it from indirect taxes.

But I must not be misunderstood. In our impatience with the old doctrine, we must be careful not to jump too far to the other extreme. While it is true that property taxes which are not shifted tend, according to the absorption theory, to be capitalized, thus exempting the future owner, the burden still remains on the present owner. That is the very meaning of absorption, as opposed to diffusion. Final disappearance does not mean immediate disappearance, and in many cases the immediate results are the important ones for the individual. It is manifestly unfair to make the present bear all the load of the future.

Hence it behooves us to go slowly. We must hesitate before levying high special taxes on particular kinds of business for fear of injuring the business itself, and thus sacrificing both future and present. We must pause be-

fore accepting the scheme of our single tax friends, because their basis is too narrow, and the sacrifices demanded from the present owners of land are too heavy. *Per contra*, we need not accept the old project, now again furbished up and presented by some, that the ideal impost is a tax on all forms of productive capital,—for quite irrespective of its magnificent impracticability, the theory of capitalization renders it quite unnecessary.

Our American system is therefore moving in the right direction. We do not levy our so-called indirect taxes indiscriminately as of old; but apart from the tariff, the importance of which is only secondarily fiscal, we limit the subject of federal taxation to a very few articles of widespread consumption. We no longer in our most advanced states attempt in practice to levy a general property tax, but are content, as is almost true in New York to-day, with state taxes levied not on individuals, but on inheritances and corporations. Finally, while in local taxation we still hold to the theory of a general property tax, in practice we are fast coming to the well nigh exclusive taxation of real estate.

But whereas we are moving in the right direction in these commonwealths where the conditions are ripe, simply because the economic facts are too strong for the law, the law still conforms to the old theory. And the difficulty of altering the law is ascribable to the fact that neither our statesmen nor our economists have yet been able to frame a theory which will at once explain the conditions and respond to the sense of justice in the popular mind. Let us hope that when once we shall have realized the true implications of this newer theory which emphasizes the social aspects of economic law, we shall be able to prove to the satisfaction of all that in order to secure justice we do not need to impose a tax which seeks equally to hit in first instance every indi-

vidual member of the community. We shall then grasp the fact that while equality from the individual point of view means equality as abstracted from class differentiation, equality from the social point of view means equality only within the class, and is compatible with an ostensible inequality between the classes. For here as elsewhere, all is not what it doth seem, and the apparent original inequality, when subjected to the crucible of social analysis and social process, resolves itself into a higher equality.

In conclusion, then, let us not minimize the revolutionary character of the general principle which is the burden of my theme. I submit it indeed with diffidence, but with a firm conviction that if true it is destined to lead to important results. If the social aspect of economic law is really as significant as I think it is, we must rebuild large parts of our economic edifice. We must recognize that the psychological school of economics has gone off on a wrong tack, not because they emphasize psychology, but because their psychology is not of the right kind; we shall have to confess that the opposition between the cost theorists and the utility theorists, is to a great extent needless; we shall have to revise our attitude to the problems of international trade, of private property, of the relations of labor and capital; and above all, we shall be compelled to rewrite our works on Taxation and Finance.

Let me trust, however, that there will be no misconception of the real bearing of my contention. The subordination of the individual to the social element in economic life and law does not imply any depreciation of the individual as such, nor does it mean that the ideal polity of the future must resemble the crude socialism that is so loudly proclaimed by some. For all human beings, after all, the goal of endeavor must be the perfec-

tion and the fruition of those latent qualities and possibilities that distinguish us from the brutes and that constitute our personality. Moral development means self-development, and progress can come only through freedom. Individualism in this sense is the very goal of all achievement.

We must, however, not forget that the individual has become what he is largely through society. Let us remember that side by side with the individual struggle for existence, there has been the group struggle and that, as has recently been pointed out, the mutual aid within the group has been the very condition of the contest between the groups. Let us remember that the individual as he exists to-day has been hammered out by society, that individual ethics is the result of social ethics, and that individual progress is largely the consequence of social progress.

Economics, politics and ethics are each of them a part of the greater social science. In each of them we find the universal problem of attaining unity in multiplicity. The aim of economics is to show the reconciliation of private wealth with public welfare; the object of politics is to secure individual liberty through a free commonwealth; the goal of ethics is to prove that individual morality is in harmony with the very conception of the universe. Economics shows how a prosperous individual can come only through a prosperous society; politics teaches how a free individual can persist only in a free society; and ethics makes it clear how a perfect individual can be conceived only as a constituent of a perfect society. Prosperity, freedom, morality—all alike are at bottom social conceptions. They can be reached in practice only through a common striving together; they can be comprehended in theory only through an analysis which accentuates the social element.

ADDRESS OF WELCOME

EDWIN A. ALDERMAN

I give you a very hearty welcome, gentlemen of the American Historical and American Economic Associations, to the lower South, to the city of New Orleans, and to Tulane University. Your presence here adds a certain charm and distinction to this gracious holiday season. We, to whom this city is home, desire to make it a real home for you, though the roof-tree that shelters you may be many leagues away. We are glad to have you here, not only for yourselves, but because we believe that you can help us to deal wisely with our problems, which are many and grave. The historian and the economist are to me the most interesting of men. Their laboratory is humanity, and their aim a state of society in which men can make the most of themselves. The task is an appalling one, but I believe the names of some of you will be held in honor by men, because of this aim, when the more dramatic figures you study, as they stagger under the burden of their millions, will be quite forgotten save as mere social phenomena.

You have come, I think, to a very fascinating portion of the most fascinating nation on earth, considered from the standpoint of the historian and the economist. Certainly, nowhere else on earth is there offered to thoughtful men a more interesting study in social self-realization or in the course of this great democratic experiment. The noble lines of a wonderfully human experience are visible on its face—experience of sorrow and loss and disaster, of battle and siege and pestilence, of joy and pride and achievement. No Francis Parkman or Theodore Roosevelt has told the story of the "Winning of

the Southwest." Great deeds have been done here. Here an empire was born, and here a great battle was fought which gave a hero to democracy, and thus gave to democracy its opportunity.

The New Orleans that you honor with your presence to-day is a community of boundless hope, of almost joyous self-reliance, of an exhilarating realization of independence and self-consciousness. The Southern seaboard is coming into its own, for the balance of commercial activity is tipping, surely toward this American Mediterranean. This spirit of hope is more subtly expressed, however, than in the roar of mighty bull campaigns, or in the volume of export statistics. The divine philosophy of defeat is revealed in this spirit. It is a kind of mental exaltation, marking the reconstructive work of men who have brought the city through the most thorough-going social revolution of modern times by the use of such empire-building tools as patience, grimness, energy and faith.

The spirit of this metropolis is the spirit of the whole region. For forty years the South was practically another nation, building its social order on the basis of an inherited economic misconception. For another forty years it has been striving to retain its best traditions, its idealism and its simplicity, to recover the industrialism in commerce and education which it had lost, and to achieve nationalization in politics and liberalism in opinion. The South has regained the spirit of industrialism with which it started. Many details remain to be worked out, but the spirit is there. By industrialism I do not mean commercialism. Commercialism is a mere sordid theory of life. Industrialism is the scientific mastery of the raw material and its wise disposition according to the laws of trade. Thus considered, indus-

trialism is a mighty and a moral part of the movement of society. When the practice of industrialism catches up with the spirit, politics will be nationalized and thought liberalized in the South, for the economic structure of society is largely responsible for its ideals. Our real problem, therefore, is to try to industrialize our society without commercializing its soul. I wonder if the thing is possible?

The tragic fundamental fact in Southern life is an economic fact—the presence here in large numbers of the African as a great economic factor. There has not been a moment in sixty years, largely owing to his presence, that the South has not passionately subscribed to one of two or three great political dogmas or doctrines. We are, as a consequence, the sturdiest political metaphysicians of our race with a capacity for political solidarity that is almost distressing. For sixty years the South stood ready to die, and did die, for the doctrine of state sovereignty. To-day it would die with even more amazing oneness of mind for the doctrine of racial integrity or the separateness of the two races. This does not mean race hatred. There is a certain amount of race hatred, of course, and there are reasons for this, but the best Southern people not only do not hate the negro, but come nearer to having affection for him than any other people on earth, and they hold this faith in a spirit of common sense and justice and sympathy and helpfulness to the black race. They are too wise not to realize that posterity will judge them according to the wisdom they use in this great concern. They are too just not to know that there is but one thing to do with a human being, and that thing is to give him a chance, and that it is a solemn duty of the white man to see that the negro gets his chance in everything save social equality and po-

litical control. The Southern people believe with their usual intensity that it is the duty of civilization always to protect the higher groups against the deteriorating influence of the lower groups. This does not mean that the lower should be prevented from rising, but that it should not be permitted to break down the higher. The improvement and progress of the backward nations and races should all come by improving the condition of their own group, but should never be permitted to come at the expense of the higher or more advanced group, nation or race. Social equality or political control would mean deterioration of the advanced group, and the South is serving the nation when it says it shall not be so. But I am not here to discuss this question. Discussion of it has become a national disease and should be quarantined against, for it is getting hysterical and dangerous. The doctrinaire and magazine writer thought they had settled it thirty years ago. How foolish seems their talk to-day! My prescription is "silence and slow time," faith in the South and wise training of both white and black.

The idea I wish to present, however, is this. A people who hold to high political doctrines, which do not admit of compromise in their minds, gain in a genius for intensity of conviction what they lose in liberalism. They become idealists—possibly martyrs to an idea. Great virtues, like unsordidness, unselfishness, simplicity, patriotic devotion, come to dwell within them. They cease to fear anything but denial of their doctrines. You can not frighten them with poverty, oppression, obscurity or any other terror. You can not cajole or deceive them. They become single-minded and self-centered. It is plain to me that by the very tragedy of its history, the South is the most idealistic section in

America to-day. New England was forty years ago. Industrialism has diminished idealism there, though not moral persistence or love of order. The South to-day wants wealth and success and power, and is hot-footed on the trail of it, but it would imperil all for its dogma. It is still a land of enthusiasms, loyalties, principles and slogans. It still loves a good generous phrase like "the consent of the governed." No other people except the French will so quickly rally around a phrase, or a doctrine, or a song, or an attractive personality like the Americans of these Southern states.

Now, I believe that America needs this intense idealism of the South, stamped into its life by its sad, strange history. The nation should thank God that it is here, for after all, it is a spiritual force needed to help combat vulgar strength and coarse power. I have said that industrialism will change this idealism, and so it will, but it is too deep for destruction or submersion. For generations it will play about some phase of national life, for sectionalism as a philosophy or a creed has gone forever, unless it shall be galvanized into life again by the harmonious coöperation of Senator Tillman and the Union League Club. It was travelling fast toward the conception of national unity, for which it stood so grandly in the early days, when, somehow, it got shunted off, but it will return to that—at least, so runs my dream, and so points my logic. Whenever this vast grip of Southern idealism takes fast hold of the idea of national unity, of national destiny, of national hope, the great republic that we all love and count it a glory to serve, will feel its buoyant power as men in the valley feel the tonic of the upper altitudes. I wish for you, gentlemen of the two Associations, a session of freedom of speech, of wealth of learning, and of much pleasure and profit.

SUGAR

WILLIAM C. STUBBS

In discussing "Sugar" before this Association, it will I hope, be remembered that I am a Louisianian and have spent many years of my matured manhood in the study of the sugar cane, and if therefore in my remarks I confine myself mainly to this plant, it will be another verification of the old adage that "out of the abundance of the heart, the mouth speaketh."

DEVELOPMENT OF THE INDUSTRY

The sugar industry of Louisiana began in 1794, nine years before the Louisiana Purchase. Starting with the \$12,000 commercial crop of Etienne De Boré, grown upon the grounds of the present Audubon Park in 1795, the industry has expanded until it occupies a goodly portion of the South Atlantic and the Gulf coasts from South Carolina to Mexico.

In Louisiana and Texas sugar is produced in large quantities. Elsewhere syrup alone is manufactured, though near Bainbridge in Georgia, a sugar house has recently been erected for the purpose of essaying the manufacture of sugar. In spite of the many serious obstacles, the sugar cane industry has grown and expanded until the average annual output is not far from \$40,000,000.

The sugar house in this time has undergone several radical transformations. De Boré's horse mill and iron kettles have, through an almost continued process of evolution and improvement, eventuated in the central factory of to-day with its ponderous mills and crusher,

or diffusion batteries, superheaters, filterpresses, triple effects, vacuum pans, centrifugals, crystallizers and granulators. One similarity remains. Once the oxen propelling the mills were fed upon the tops of the canes they were crushing; to-day, the refuse of the cane, the bagasse, constitutes the main fuel under the boilers, where steam is generated which propels the mills that crush the cane and evaporates the juice obtained therefrom. So great indeed have been the changes in our modern central factories that an ante-bellum planter would not recognize one as a sugar house at all.

The agriculture of sugar cane has kept pace with its manufacture. The old mould-board plow and home-made harrow have long ago been succeeded by the improved turn plow and revolving harrow, and these in turn have been supplanted by the disc harrow and plow. Improved labor-saving cultivators have largely displaced expensive hoe gangs, and the cane harvester now being evolved from the brain of genius is everywhere awaited as the first valuable contribution of the new century to the great sugar cane industry of the world. The "Louisiana Sugar Planters' Association" has a standing prize of \$2500 for such a machine. Drainage is recognized as a prerequisite to large crops, while irrigation is appreciated by all and practiced by few. The alluvium of the Mississippi delta, once regarded as inexhaustibly fertile, is to-day manured annually with thousands of tons of tankage, cotton seed meal and acid phosphate.

These marvelous developments have been evolved from numerous and sometimes seemingly insurmountable difficulties which have attended the industry from the beginning. Floods have repeatedly inundated whole sections and destroyed thousands of acres of cane.

Pestilence "that walketh in darkness" has several times laid a heavy hand upon large districts. The Civil War almost annihilated the industry, fifteen to twenty years being required for its partial recuperation. Low prices and unreliable labor have frequently shorn the industry of its profits. Unfriendly legislation has brought the coolie-raised or bounty-fed sugars of other countries into direct competition with that grown in the South. And lastly, and perhaps the most serious obstacle of all, is the want of permanency in our national legislation, a defect inherent in our form of government which gives the people the opportunity of overturning the "powers that be" every four years. These obstacles have developed self-reliance, investigation, study and thought, and to-day Louisiana is justly esteemed the leader of the sugar cane world, and is sending words of intelligence and experience to every tropical sugar country.

This progress, wonderful as it has been in the aggregate, has been obtained through much suffering, large expenditures of money, and thorough practical and scientific experimentations. It may be truly said of Louisiana, that nearly every dollar made by the sugar planters since the war has been utilized in the improvement of their estates, and in the reconstruction and enlargement of their sugar houses, until to-day they represent, altogether, an investment of \$100,000,000.

INTRODUCTION OF CANE SUGAR

Time and space forbid a detailed account of the introduction of the sugar cane into Louisiana by the Jesuits in 1751, and the many unsuccessful attempts at sugar making before 1795, the immoderate use of taffa, a rum made from the juice of the cane, and the excite-

ment and interest attending De Boré's successful attempt at commercial sugar making in 1795 which stimulated scores of planters to follow his example, thus inaugurating the sugar industry of Louisiana and the South. The names of Dubreuil, Mazan, Destrehan, Mendez, Solis, Morin and De Boré are inseparably connected with the early history of sugar cane in this state.

The first cane introduced into Louisiana was the Malabar, Bengal, or Creole variety, from which De Boré made his first crop of sugar. The Tahiti variety was introduced about 1797, and with the Creole, furnished the seed for the planters until John J. Coiron introduced the striped and purple varieties from the coast of Georgia in 1817 and 1825. These varieties soon supplanted the others and gave by their superiority an additional impulse to the sugar industry. It may not be out of place here to mention an appropriation by Congress in 1856 of \$10,000 for the purpose of obtaining cuttings of sugar cane of such varieties as were best suited to the climate of the Southern states. The Commissioner of Patents, in coöperation with the Secretary of the Navy, provided two expeditions to secure these canes. One went to the Straits Settlements and brought back the Salangore variety, which was so badly rotted on arrival as to give no results.

The brig *Reliance*, with Mr. Townsend on board as entomologist, visited British Guiana and Venezuela with specific instructions from Commissioner Brown to bring back certain varieties found near Caracas. Mr. Glover brought back 1008 boxes early in 1857. The newspapers of that day were filled with severe arraignments of all parties engaged in the introduction of these dead and worthless canes, but Commissioner Holt in his an-

nual report for 1857, speaks of the promising condition of the canes imported into the South from Demerara which "in the end amply compensate for the trouble of introducing them." The evidence is contradictory, but it is well known to our older planters that no canes grew from either of these importations.

In 1872, Mr. P. M. LaPice on his return from Java brought back with him a white cane which now bears his name, and which is quite largely cultivated in certain localities of this state. Mr. DuChamps imported the Purple Elephant variety in 1875, and Mr. Palfrey of St. Mary parish, introduced about the same time the Bourbon variety, which locally bears his name. Mr. LeDuc, the Commissioner of Agriculture in 1877, caused to be imported from Japan a peculiar variety called Zwinga or Japanese cane. It is an excellent hardy variety, stooling well. The stalks are very small, and though of little value to the sugar planter of Louisiana, it has recently found high favor with the small farmer in Florida for the manufacture of syrup. In 1886, the Sugar Experiment Station, through the kind offices of Commissioner Coleman, began the importation of foreign canes and now has over seventy-five varieties growing upon its grounds.

All efforts, however, to increase the sugar yields by a selection and acclimation of foreign varieties have been entirely suspended by the discovery of the ability of the cane seed (hitherto deemed infertile) to germinate and produce "seedlings." Now every sugar country is producing annually thousands of seedlings and from them propagating those which promise the largest tonnage with the highest sugar content. The Sugar Experiment Station of New Orleans has experimented with a

number of these seedlings and has distributed in large quantities two of the most promising ones, no. 74 and no. 95, to the planters of this state. These seedlings are meeting with great success and hope is confidently entertained that they will ultimately supplant all other varieties and greatly increase the output of our sugar houses.

OUTPUT

It would be curious to trace the fluctuations in our sugar output since 1795. Freezes, overflows, droughts, excessive rainfalls, variations in the prices of sugar and cotton, have been some of the local disturbing influences, while national legislation has always exercised a profound effect. It may be mentioned that in 1844 and 1845, on account of the low price of cotton, the cultivation of the sugar cane was extended to the upper parishes of this state and to Mississippi. This successful extension of the sugar industry into the cotton fields alarmed the sugar planters of the coast who positively asserted that with the high tariff of 1842 on sugar and the low price of cotton, that the entire cotton belt would go into sugar culture and ruin the industry. This is the only mention in history of the objection on the part of any sugar planter to a high tariff on sugar. The average crop of Louisiana is now not far from 300,000 long tons of sugar, though the crop for the year just closing, on account of an unfavorable season, will probably be ten per cent less.

The most serious obstacles heretofore encountered by planters in the successful growing of cane sugar have been the occasional crevasses and overflows. With sugar cane, where the stalks are planted and where from two to six tons of cane per acre are required for seed, an over-

flow is often fatal to a planter. Several years will be required to grow enough cane to re-plant and re-establish the prevailing rotation on an estate, and few planters can stand such a disaster. In 1887 Congress created the Mississippi River Commission, whose duty it is to improve the navigation of the river and works connected therewith. Its duties included the construction and maintenance of levees. This action by the national government was promptly seconded and supplemented in Louisiana by the creation of levee districts, governed by levee boards with power to issue bonds, levy and collect specific taxes, and erect and maintain efficient levees. There are about a dozen of these districts in the state, and from the bonds sold and taxes collected, supplemented with appropriations from the Mississippi River Commission, the levees of the state have been rebuilt, strengthened and raised above the highest watermark known. It is believed that the day of overflows has gone.

I have already alluded to the tariff and its influence on the sugar industry. The first duty levied on sugar was in 1789, which was augmented in 1790, 1797 and 1800. These duties were imposed at a time when there were no lands within the United States suitable for sugar cane and no sugar cane was grown. In the war of 1812 the duty was five cents per pound, but was lowered to three cents in 1816. They were levied for revenue only, and the tariff of 1816 continued until the compromise act of 1832. Since that time sugar has been the foot ball of each political party and has been subjected to frequent and severe tariff changes. Since the establishment of the United States in 1789, the tariff on sugar has been changed twenty times, fluctuating

between three-quarters of a cent in 1861 and five cents during the war of 1812. From 1890 to 1893, brown sugar was admitted free, but the sugar producers were paid from one and three-quarters to two cents per pound bounty. With this exception, sugar has always been an important source of revenue to the general government, the duty averaging about two cents per pound. Permanency in national legislation is almost necessary to the continued prosperity of any industry.

THE PLANT

Sugar cane is a gigantic grass of the genus "saccharum." All cultivated varieties are classified under one species, "saccharum officinarum." Cane goes to seed in tropical countries, but the seed are small, with much adhering pappus, often infertile, and germinate with difficulty. They are never used for planting the crop, but are germinated in experimental work for originating new varieties (seedlings). The cane crop of the world is propagated by planting the stalks, as in Louisiana, or the tops of the stalks, as in many tropical countries. The stalks are made of joints and at each joint is a bud or eye, which develops by planting into a stalk. Each stalk soon tillers until a bunch of stalks is produced.

PREPARATION AND CULTIVATION

The ground is thoroughly broken with disc or mould board plows, drawn by four to eight mules. Rows from five to seven feet wide are thrown up with two-horse plows. An open furrow is made in the center of the row with a double mould board plow. Into this open furrow are deposited two to four continuous lines of canes. These are covered by a plow or cultivator, followed by hoes, and the process of planting is completed. Two to

six tons of cane are used to plant an acre. As soon as the cane begins to sprout, the rows are off-barred on each side with a two-horse plow and the dirt covering the cane is partially removed in order to hasten the process of germination. When a good stand of cane has been secured the dirt is returned, the middles of the rows are opened and the process of cultivation begins. This is accomplished with plows, cultivators and hoes, and is continued until the cane is large enough to shade its rows and prevent the growth of weeds and grass when it is laid by. The ditches are then well opened and the quarter-drains cleaned. This is the final act in cultivation. Cultivation is best accomplished by the use of cultivators, the disc to straddle the row of cane, and the "diamond toothed" to split out the middles.

Cane is planted at any time between September and April that the convenience of the planter and the weather and condition of the soil will permit. It is usually laid by in June or early in July. After "lay by" the cane grows rapidly, particularly if frequent showers at short intervals conspire with warm weather. In Louisiana the general harvest begins in October, and lasts till January. On account of the severity of our winters, cane must be harvested in the fall and early winter, or be killed by the frost. It is therefore only about eight or nine months old when worked in the sugar house.

EXTRACTION OF THE JUICE

There are two processes of extracting the juice from the cane, pressure and diffusion.

The juice from the sugar cane is usually extracted by passing the canes through heavy iron rollers driven by powerful engines. A combination of from three to nine rollers constitutes a sugar mill. The more numer-

ous the rollers, other conditions being the same, the greater the quantity of juice extracted. Many sugar houses have in front of their mills, crushers or shredders, which prepare the canes for the mill. Frequently after the canes have passed through the first set of rollers (usually three) they are saturated with water or steam and then passed through another set of rollers. By this process, known as "maceration," a larger extraction of juice is obtained. This is usually practiced in large mill houses, giving extractions of 75 to 84 per cent of juice on the weight of the cane.

The second process is by diffusion. Beets have always been treated by the diffusion process. Recently the same process has been used with sugar cane. The process, briefly, is as follows. The canes or beets are cut up into small pieces by specially designed knives and carried into large, cast-iron cells, known as diffusors. There they are treated with hot water under pressure. Ten to sixteen cells constitute a battery. The juice is driven out by force from cell to cell over fresh chips, until it contains nearly as much sugar as the natural juice in the plant, when it is drawn off and sent to the juice tanks to await the treatment described further on. When water has passed over the chips a sufficient number of times to remove nearly all the sugar (a fact determined by chemical analysis), the cell is opened from its lower end and its contents dropped on a carrier, which conveys them away. When the cell is again closed below it is at once refilled with fresh chips from the top. In the continuous march of diffusion work, one cell is being emptied and one being filled all the time, the rest being filled with chips and closed, subject to the constant flow of juice. To each cell is attached a heater or "calorisa-

tor," and through this the juice is made to flow in its passage from cell to cell.

CLARIFICATION

The juice obtained is subjected to the following treatment. If white or yellow sugar be desired the juice is treated with the gas obtained by burning sulphur. This bleaches it. It is then drawn into large copper vessels, holding from 400 to 1500 gallons, with steam coils at the bottom, called "clarifiers." Here it is treated with milk of lime until the acidity of the juice is neutralized, and then it is heated nearly to the boiling point of water. This treatment brings to the surface a heavy blanket of impurities which is brushed off into another receptacle and finally sent into a filter press, where the juice is expressed and the solid impurities remain imprisoned between the plates of the press. When the filter press is full of this solid substance, it is emptied and made ready for fresh work. Superheated-clarifiers are used in many factories.

After cleaning, the juice is evaporated quickly to a syrup containing about 40 per cent of sugar. This evaporation is performed in open pans, or in closed vessels, in each of which a partial vacuum is maintained. Direct steam is used in the former, while exhaust steam from the engines, pumps, etc., serves the latter. These closed vessels are called "effects," single, double, triple, or quadruple, according to the number used. The principle is this: exhaust steam is made to boil the juice in the first vessel where 10 to 15 degrees of vacuum (20 to 15 degrees of pressure) are maintained; the vapors from the first vessel are made to heat the juice in the second vessel where a vacuum of 25 to 28 degrees is held, etc. The vacuum in each vessel can be regulated at the

pleasure of the operator, according to the number of vessels used. By this process the evaporation is performed at a minimum expense and at a temperature considerably below the boiling point of water, thus escaping the danger of caramelizing sugar, a thing frequently done in open vessels at high temperature.

By either of these processes a syrup is obtained which is sent to the vacuum strike pan where it is granulated. This pan consists of a closed vessel with three or more interior coils, situated one above the other, through which the steam may circulate. To this pan is attached a vacuum pump, which removes the air and vapor from the pan as fast as formed. The vapor is then condensed by a constant stream of water flowing through the pump. When the proper vacuum is obtained, usually 26 to 28 degrees, the syrup maker takes his first charge of syrup, turns heat into his lowest coil, and begins again the process of evaporation. By gradual charges enough syrup is concentrated to begin the formation of the grain. As the pan is filled, the different coils are opened and additional steam turned on. After concentrating the syrup to a sufficient density small grains begin to appear. These are examined at short intervals by removing a small quantity on a proof-stick, and when sufficiently numerous, the process of building the grain begins. This is done by carefully feeding them with fresh syrup taken in, in small quantities, at short intervals. Finally the grain has grown to the proper size, the pan is full, and a strike must be made. Before the latter is performed full heat is turned in on all the coils, the grains are hardened and the entire mass cooked to the proper density. Then the bottom of the pan is opened and the stiff semi-fluid mixture of sugar

and molasses, called "*masse cuite*" is emptied into a large mixer, where revolving paddles keep it from solidifying. From this mixer it is drawn into centrifugals which, revolving at the rate of 1200 to 1500 times per minute, throw out through the fine sieves the fluid molasses and retain the sugar.

The molasses is caught in the lower basket and directed to a large receiving tank. After the molasses has been removed the sugar is washed with more or less water, or pure sugar syrup, according to the quality of sugar desired. In this way brown, yellow clarified or white sugar may be obtained, at the option of the operator. These are called first sugars. Frequently, when yellow clarified sugar is desired, the wash water contains a small quantity of some salt of tin to give the sugar a desirable yellow tint.

The yellow clarified and white sugars thus made go at once into commerce. Sometimes the latter is granulated before offering it on the market. The instrument used is called a granulator and consists of a large, hollow revolving cylinder, so arranged that the sugar conveyed into it at one end is carried slowly through it, and during its passage is heated to expel the last trace of moisture. It emerges as granulated sugar and has the advantage of not caking, even in the dampest climate. The brown sugar made as above, formerly went into consumption as such, but now goes almost entirely to the refinery.

The molasses thrown off by the centrifugals, in the above operation, is drawn up again into the vacuum pan and cooked either to grain with fresh syrup and centrifugaled, or to such a density that when a small portion of it is drawn between the thumb and finger it

will string out into a fine thread before breaking. When this density is obtained the mass is emptied either into crystallizers stirred by paddles, where it grains quickly, or into iron wagons and rolled into a hot room, where a constant temperature of 110° to 115° F. aids the granulation of the contained sugar. This process is called cooking to "string" and its sugar "string sugars," in contradistinction to "grain" and "grained sugars." In a few days the mass, either in the crystallizers or in hot room, becomes charged with crystals and the latter are separated by centrifugals. It is almost impossible to obtain other than brown sugars by this process, and of course they go to the refineries. They are known as "second sugars" or "seconds." The molasses from the second sugars is again subjected to the same treatment, and the sugars therefrom are called "third" sugars or "thirds." Sometimes "fourths" are made. The final molasses finds its way to the markets either in barrels or in tank cars under the name of centrifugal molasses. It is black, thick and uninviting, containing but little sugar, and possessing very little value.

"OPEN-KETTLE" FACTORIES

Unfortunately not all of our factories are so advanced. The open-kettle sugar house still exists, although the number is gradually diminishing. The methods of extraction of juice by mills is similar to that described above. It is evaporated differently. Four large iron kettles arranged in a line, encased in brick, with a continuous furnace under them, constitute the outfit. These kettles, descending in regular order in size, are known as the "grande," the "flambeau," the "sirop," and the "batterie." The juice, after being sulphured,

is drawn into the grande, where it is limed, heated and the scums removed. It is then dipped into the flambeau, where it is brushed and cleaned, then passed to the sirop, where it is further brushed, and finally into the batterie, where it is concentrated to the granulating point—a density of about 45° – 50° Baume, and with a temperature of about 240° F. At this point it is dipped out and run into long troughs, called coolers, placed in the purgery. In a few days this “masse cuite” becomes solid, and preparations are then made for “pott-ing.” This process is as follows. In every open-kettle sugar house is a room called the “purgery.” The floor of this room is cemented and inclines from every direction toward a large cemented cavity known as the molasses cistern. In this room the potting is done. Empty hogsheads are brought in and three one-inch sugar holes are bored into each bottom. Into each hole is inserted a large stalk of cane with the end cut in the shape of a triangular prism and its sides beveled. After placing the hogsheads in position they are filled with the “masse cuite” from the coolers. By the aid of spades and shovels the “masse cuite” is dug up, the lumps pulverized and transferred to the hogshead. The molasses following the beveled edges of the canes percolates downward and emerging through the auger holes in the bottom, flows over the cemented floor into the molasses cistern. In a few weeks the sugar is drained of its molasses. The hogshead of sugar is headed up and shipped off to market. Little or none of this sugar now reaches the consumer. It is sold to the refineries.

It is not so with the molasses. If the operations have been carefully performed the molasses is excellent and commands fairly remunerative prices. It is called

"open-kettle molasses" and is held in high esteem. Sometimes a small well is dug into the solid mass of the cooler. Into this well percolates the molasses which is dipped out as fast as it accumulates. This molasses is called "bleedings," and is in large request at high prices. But little, however, is made.

Another product of the open-kettle sugar house is syrup or "sirop de batterie." This is the well clarified juice concentrated to a syrup in the batterie or last kettle, in which ordinarily the strike sugar is made. It is highly esteemed and early in the season brings extravagant prices.

Popular error exists as to the terms molasses and syrup. The former refers always to the drainings from the sugar, while the latter is the concentrated juice of the cane with all the sugar in it. The former will not easily ferment or crystallize, and therefore can be kept for a long time. The latter, if too concentrated, will granulate, and if too thin will ferment. It therefore cannot be kept a very long time without sterilization.

Often instead of evaporating the juice in kettles heated from underneath by an open fire, a series of pans are arranged, each with steam coils in the bottom. The juice is clarified and brushed in the first and concentrated in the remainder, the last one of which is the "strike pan." These are called steam trains.

GRADES

We have considered the usual products manufactured by the sugar houses directly from the raw material. These products are shipped to market and sold either for consumption or for refining. Nearly all of the open-kettle and the second and third centrifugal sugars go to the refiners, little or none going directly into the

trade. On the other hand, nearly all of the first centrifugal sugars go directly into commerce, provided they have been properly washed, and are sold for consumption to our groceries.

On the Sugar Exchange in New Orleans the following classifications have been adopted for plantation products. For centrifugal sugar: "plantation granulated," "off granulated," "choice white," "gray white," "fancy yellow," "choice yellows," "prime yellows," "off yellows," "seconds." For open-kettle sugars: "choice," "strictly prime," "prime," "fully fair," "good fair," "fair," "good common," "common inferior." For both open-kettle and centrifugal molasses: "fancy choice," "strict prime," "good prime," "prime," "good fair," "fair," "good common," "common," "inferior."

Color alone determined the above classification, and until recent years was the only factor which gave value to the sugars, syrups or molasses. Now everything destined for the refineries is subject to polariscopic tests and the percentage of sugar therein is the ruling factor. Open-kettle sugar rarely surpasses 90 degrees polariscopic tests and seldom falls below 80 degrees, while first centrifugal sugars rarely fall below 90 degrees and sometimes go over 99 degrees. Chemically pure sugar gives 100 degrees. Syrup, when bought by the refinery, and molasses when bought by the distillery, are both subjected to chemical analyses which determine their values.

HOW PACKED

All centrifugal sugars of every grade are packed in barrels holding about 350 pounds, while open-kettle potted sugars are shipped in hogsheads holding from 1000 to 1500 pounds. Molasses and syrups are sent to

the consumers in barrels holding about 50 gallons each. To dealers, molasses is often shipped in tanks located on a flat-car. It is pumped into the tanks from the sugar houses, and pumped from the tanks into large cisterns when received at its destination.

MIXING AND BLEACHING MOLASSES

A large trade is carried on in mixing glucose syrup, made from corn, with Louisiana molasses. This mixture is sometimes branded "Louisiana syrup" or "molasses." So great has become this industry that it is difficult to buy a brand of pure Louisiana molasses, except from first hands on the levees.

Brightening dark molasses has also become quite a business in some quarters, and specially prepared chemicals are sold for the purpose. Much of the black centrifugal molasses is thus bleached and sent into the market at higher prices. This will continue despite the laws against it, just so long as the trade buys its goods on color. Thanks to the prevailing low prices, little or no adulteration can now be found in the sugars of commerce.

CONDITIONS AND PROSPECTS FOR CANE SUGAR

Taking a retrospective view of the sugar industry of Louisiana for the last fifteen or twenty years, it can be said with truth that there is no industry in the world that has made such progress. The organization of the Sugar Planters' Association in 1877, may be regarded as the starting point of the renaissance of the sugar industry. Since that time the Sugar Experiment Station has been established, whose teachings and experiments have illuminated the field and the factory. The *Louisiana Planter and Sugar Manufacturer* has been

started, whose weekly visit to the home of every planter, manager, overseer, and sugarmaker, carries with it information upon every subject pertaining to the agriculture of sugar cane and the chemistry and manufacture of sugar. The Sugar Exchange has been created in New Orleans, where the products of the plantations are quickly sold.

Small sugar houses are fast disappearing, and enormous factories with every modern labor and fuel saving apparatus, are to be found in every section. The output of sugar, both per acre and per ton of cane, has been greatly increased.

The crop of 1902 brought about \$30,000,000, and gave employment directly and indirectly to nearly half a million of people. Every dollar received was exchanged for labor, material, provisions and clothes. This large sum is paid out as fast as received, and a portion of it doubtless finds its way to every state in the Union, thus creating an inter-state commerce of nearly \$60,000,000.

The Brussels convention, by abolishing the export bounties and cartels, has caused a reduction of the European beet sugar output. With the abolition of the bounties has come also a reduction in the internal revenue charges on sugar in several countries, with a consequent increase in domestic consumption. It is reported that the European beet sugar crop of this year is 1,000,000 tons below that of its predecessor. The menace to the cane sugar interests which previously existed in Europe's beet sugar surplus, has been materially modified. Hamburg no longer fixes the price of sugar in the American markets. The advantage hoped for through this reduced production and increased con-

sumption in Europe, has been largely destroyed by a notable increase in the production of cane sugar in the tropics, particularly in Cuba.

The United States must take this surplus of cane sugar, and hence our markets are not yet materially affected. Despite the reciprocity treaty now in full effect, January deliveries of raw sugar from Cuba are offered at 2.15 cents per pound, as against 2.06 of last February. The United States will consume this year 2,650,000 tons, of which about 1,000,000 will be furnished by domestic sources. The cane sugar of the tropics will more than supply the remainder.

One fact, however, is patent. The supremacy of European beet sugar is gone. Cane sugar under scientific and systematic direction has regained its sway and will doubtless hold it until the end of time.

SUGAR—DISCUSSION

JOHN DYMOND: Louisiana, as a colony, quickly developed into plantations, and when Etienne Boré, a century or more ago, made sugar manufacture an industrial success, our present great sugar industry, and our plantation systems were born into the world.

The sugar planters of Louisiana bought their lands and paid for them; they ventured upon splendid improvements, leading the world in scientific agriculture, skillful mechanical engineering and good financiering. Our citizens of culture and capital sought the plantations, and the trade of the town was left in the hands of those content with it.

This great body of sugar planters climaxed in magnificence during the decade preceding the Civil War. The planters then dominated in the affairs of the state and were loth to engage in the war. With the Civil War came the cutting of the Mississippi's levees, the burning of the sugar houses, the destruction of the labor system, and the loss of all accumulated capital.

Four decades have passed since then, and they have wrought a wondrous change in the industry. For a generation before the civil war it had been the main support, directly or indirectly, of half the people of our state, and half of the accumulated capital of the state was utilized in it. With the cessation of the Civil War, active and earnest efforts were made to revive the Louisiana sugar industry. New men and new capital came into it, but its halcyon days were gone. All attempts at recovery were along the old lines, and for years but little progress was made. Most of the old, wealthy,

cultivated, ante-bellum families had some representatives left in the field, but many new people with no regard for family traditions, and with an eye to the almighty dollar alone, came to the front. The old plantations were in many cases sold out by the sheriff. The old families, some of whom were direct descendants of the French and Spanish nobility, were driven by poverty from their ancestral homes. Their places were taken by the country merchants, local capitalists, successful managers, by city capitalists operating through agents, and in this quiet, scarcely perceptible way, came about a change in our civilization that those who are only familiar with the new can hardly appreciate.

Individual families have fallen by the way; the ranks of the old *régime* have been practically dispersed, destroyed, but the sugar industry survives, and is to-day on a firmer footing than has been general in its history. The sugar planters of Louisiana in 1877 organized an association to secure and compile data concerning every phase of the industry. A few years later, in 1885, they organized the Louisiana Scientific Agricultural Association, which secured to the industry and to the state the services of that eminent scientist, Dr. W. C. Stubbs, and created the Louisiana Sugar Experiment Station. Under the leadership of Dr. Stubbs, with a competent corps of assistants, we have now made Louisiana the intellectually economic center of the cane sugar world. To aid in this, fifteen years ago our sugar planters created a sugar journal, *The Louisiana Planter*, to disseminate the data they were accumulating. This journal was made the organ of the Louisiana Sugar Planters' Association and of all the rest of our sugar organizations, and to-day circulates wherever sugar is made.

1890

In this post-bellum revolution in our sugar industry, we have abandoned one of the striking features of the old industry. Formerly, with the enlargement of the sugar plantations, new houses were built at the remoter places. It was cheaper to build new sugar houses in the distant cane fields than to haul the cane itself long distances over dirt roads.

In 1870 portable tramways were introduced and gradually this led to the transportation of sugar cane in railway cars and to the developement of the great central factory system of these days. A producer of 100 tons of cane is today as sure of a market for his lot as is the larger producer of thousands of tons.

The sugar factory of to-day is a marvel of skillful creation. The highest grade of engineering ability has been utilized in its construction and the economy of fuel, of engineering supplies, and of human labor are all under constant study. The processes of the manufacture of iron and steel are no more closely studied than are those of sugar manufacture. In our fields, like progress has been made. With new implements, and learning why and how to use them, cane culture has been wonderfully cheapened. Fertilization is a matter of constant study and now the irrigation of our cane fields is pressing itself upon us. The economic side of our industry has burnt and is still burning itself into our memories and purposes and we are now all students.

RICE

S. A. KNAPP

About 1885 some optimistic farmers in Louisiana conceived the idea that improved agricultural machinery could be adjusted to the rice industry and rice husbandry could be modernized along all lines. It required some years of invention and experiment to adapt and adjust the monarchs of the wheat farms to an aquatic plant, but once accomplished, a new era dawned upon the Gulf states. If rice was to be cultivated by Oriental methods, the Occident must soon cease to produce it, for its labor was too expensive and intelligent to compete. The great reduction in ocean freights in the last half century and the more rapid transit added further peril to this industry. The possibility of using agricultural machinery in the rice fields changed the situation, and furnished the American farmer with the means for successful competition.

The present status of the rice industry in the United States is, from a productive stand-point, that the American farmer with high intelligence, complete mechanical devices, virgin lands and control of the best market in the world, is arrayed in the conflict of the industries against the ignorance of the masses, hand cultivation of the crop, semi-impoverished soils and markets that are held to the lowest point by the encroachments of poverty. While these are strong vantage grounds we should take nothing for granted, but carefully inquire, does the production of rice rest upon conditions that will compel its culture, or is the growing of rice now merely temporary direction given to industry, which some other product

will ultimately displace. Is there in the conditions here a legitimate place for the production of rice, and when produced will it meet any of the requirements of our people for better sustenance?

There are vast tracts of land along the Atlantic and Gulf coasts and in the interior that cannot be used for agricultural purposes without the thorough drainage and aeration of the soil. But this complete drainage is too expensive. Our people cannot afford to allow such large areas to remain unproductive. If perfect drainage is too expensive, the problem then is to find some plant that can prosper under existing conditions. Rice is one of the few cereals that can thrive in soils with some acidity and of excessive humidity. For this reason, if for no other, rice has become or will become an important factor in the agriculture of every nation which has territory situated in the southern temperate or in the torrid zones.

Under the systems of agriculture followed in the centuries that have elapsed, the upland soils devoted to the production of wheat, barley and oats, have gradually declined in fertility till in some countries, as in China, large tracts have been turned to commons. Not so with rice lands. For thousands of years they have yielded their annual crops and will doubtless furnish food for the nations in centuries to come. This has been credited to the inherent richness of the lands devoted to rice, to the lighter exhausting effects of the rice crop, and to the renovating character of shallow standing water all of which have some bearing. Water is a marvelous absorbent of volatile fertilizers, which to some extent impregnate the atmosphere in warm weather. These with such as arise from the cultivated lands of

the rice fields are retained by the water and restored to the soil for future use.

Another reason why nations must depend upon rice as one of its staples is the certainty of the crop. When density of population has created a demand equal to the usual product of the country's harvest, failure of the crop is a national disaster. In India or China even a partial loss imperils the lives of millions. Wheat, corn and barley may fail, and do fail occasionally with the change in seasons, but rice with a supply of fresh water always gladdens the farmer with the reward of toil. The large average resources of the American farmers and their wide diversity of products cause the partial loss of a single crop to be viewed with less dismay than among older nations, but the time is approaching when we shall need to husband all our resources and guard against disaster in the harvest.

The amount of food that can be produced per acre has an important bearing upon the selection of a standard crop. No crop responds more readily to good cultivation than rice, or more abundantly repays in the harvest all care bestowed. The coast region of our Gulf states does not take kindly to corn. With proper drainage to remove the acid from the soil, corn can be produced in remunerative quantities, but all things considered it is an expensive crop in the South. Wheat, oats and barley are winter crops and should follow rice. Rice is pre-eminently the summer grain crop of the semi-tropical Gulf coast. Climate and soil are adapted to its production. It tends to diversify and balance the agricultural products in the great fiber producing states. The by-products from milling are among the most palatable and nutritious of stock foods, and the straw if prop-

erly utilized for the food of domestic animals or for paper pulp, is worth a sum per acre nearly equal to the cost of producing the crop. In the waste of the farm lies the fortune of the farmer.

As a human food it has been common for English-speaking people to pass it lightly with the remark that it is deficient in nitrogen or frame building material. Properly understood this is one of its excellencies, for most foods are unbalanced and it is easier to make a perfect nutritive ration by basing it on an unbalanced food, as rice, than upon a balanced food as wheat. When we add to the wheat, lean meat, pork, eggs, beans, or butter, we have deranged the ratio and constructed a combined food, uneconomical because out of proportion. With rice we can make a perfect ration by the addition of lean meat, eggs or legumes. Wheat bread can then be used at pleasure, because it does not materially alter the proportion. Rice furnishes a larger amount of energy than any of the other cereals with the least tax upon the system in digestion. The substitution of machinery for handicraft has lightened the labor of our people and reduced the hours of toil. The ability with the use of machinery, to produce an abundance allows the maturing family to live without hard labor. Life is less strenuous than half a century ago so far as it taxes muscular effort, requiring less food for frame repair and more food for potential energy. With these radical changes in what is required to properly nourish the body we have continued to select and consume our foods as if we were still at hard labor and thousands are suffering the penalties of violated law. The easily digested, energy imparting rice, if allowed to form an essential part of our diet, will correct many of the ills from which we

suffer. It is a common saying that in rice eating nations the people are smaller and possess less vigor than in those which largely have a diet of wheat, the inference being that the alleged physical inferiority is due to eating rice. It is true that some rice eating people are small and indolent, but in every instance it can be traced to other causes than rice. No people subsist on an exclusive diet of rice. The proper proportions of nitrogenous foods are almost invariably added. Insufficient quantity of food, the custom of sitting upon the limbs, thus impeding the circulation of the blood, and unsanitary conditions are responsible for any inferior physical development observed in Oriental nations. It is demonstrated that such of the rice eating Orientals as are abundantly fed are physically well developed, have superb health, great mental and physical vigor, and can endure more severe labor and for a longer and more continuous period than the hardiest races of the Occident. Wounds received by them heal as upon healthy animals. They defy malaria and are not subject to blood poisoning.

In our ignorance of rice we have fallen into three economic errors. 1st. Too rapid sale of the crop. 2d. Method of milling. 3d. Preparation of rice as a food.

1st. Rice as a food is improved by age. In India it is stored a year before it is sold to Europeans for consumption. For the use of the native population it is partially cooked before milling after which it undergoes a ripening process. In the United States it is rushed upon the markets direct from the thresher as if it were not necessary for the cereals to have time for a ripening process similar to the changes in fruits.

2d. Most of the essential oils and much of the protein of rice are stored on the surface of the kernel. The

removal of this brownish coating by friction gives a pearly whiteness and a luster to the kernel which captivate the eyes of the American house-wife, but this is secured at a loss of flavor and protein which renders it less appetizing, less digestible and decreases its frame repairing capacity.

3d. Except among the native population of the Carolinas and Georgia, and the creoles of Louisiana I have found in the United States no apparent knowledge of when to use and how to prepare rice for food. In the North it appears as a desert, in the West as lonely grains in a slop, in Louisiana it is a complete meal and a banquet. It is served on the tables of common people and in the banquet halls. There it is a staple food and not a luxury.

We are now prepared to discuss the economic production of rice under the new conditions and the probability of its becoming a staple food. A comparison of the number of days work necessary to produce an acre of rice in Japan, in India, in the Philippine Islands and in the United States conveys a vivid impression of the great value of machinery in the production of this cereal. That eminent authority on all economic questions, Sir George Watt, gives in detail the cost of producing rice in Bengal, by which it appears that it requires eighty days labor and the use of a yoke of oxen twenty-one days to produce, harvest and thresh an acre of rice. In Japan, the Imperial Agricultural College places the total labor on one acre at 120 days, without the aid of any domestic animals. In the Philippine Islands the cultivation of rice is almost identically upon the plan of India, except that the water buffalo is substituted for the ox, to the detriment of progress. Possibly not quite

so many days labor are bestowed upon the crop, but the yield is correspondingly less. The labor of one man eighty days and the use of a yoke of water buffaloes twenty days would represent the time and effort to produce an acre of rice. In the rice belt of Louisiana and Texas the labor of a man two days and the use of a team one and one-half days form the maximum expenditure of effort on one acre of rice. The equation of human labor then stands as forty and sixty to one in favor of the United States, and the principal factor producing this result is American farm machinery intelligently handled. Stated in terms of the product and omitting animal aid, in India eighty days of human labor in a rice field produce 1000 pounds of rice, in the Philippines 900 pounds, in Japan allowing for teams, 3000 pounds, and in Louisiana or Texas 64,800 pounds. Expressed in pounds, a day's labor in India produces $12\frac{1}{2}$ pounds of paddy rice; in the Philippines, $11\frac{1}{4}$; in Japan, $37\frac{1}{2}$; in United States, 810. This indicates that the American farm laborer produces nearly sixty-four times as much grain as his Oriental competitor and could be allowed \$1.20 per day as a wage on the basis of two cents per day for the Indian farmer, assuming that the same price per pound is paid in both countries, which is far from true. The American farmer receives for his product nearly double the sum allowed the Indian ryot. Add to our better market the producing power of our virgin soil, and it would seem that our farmers stand upon a vantage ground from which no competition can displace them. This optimistic view is the result of canvassing conditions from one stand-point—productive power.

The moment rice leaves the farmer it undergoes a marvelous increment in price at the hands of every one

that touches it, the miller, the transportation lines, the broker, the wholesaler and the retailer, until the article that left the farmer as a staple food at moderate prices has by the time that it is offered to the consumer become a luxury too costly for the masses. The rice grains leave their humble birth-place on the Louisiana farms at the modest price of 2 to 3 cents per pound, but are offered to the consumer in most states at the prohibitive price of 8 to 12 cents per pound, a gain of 6 to 9 cents per pound from the producer to the consumer. Wheat, a product of Northern states, is milled, transported to Louisiana and sold to the consumer on a margin of $\frac{3}{4}$ of a cent to 1 cent per pound above the price paid the producer. It is thus observed that the farmers are thwarted in their efforts to popularize rice and place it upon the markets of the United States as a staple food by the exactions of commerce. But the battle of the industries is not at an end, and this with kindred difficulties will eventually be overcome by the wisdom and the energy of American farmers.

RICE—DISCUSSION

S. LOCKE BREAUx: Let us consider, for a few moments some of the commercial phases of the cultivation and marketing of rice.

Granted the correctness of the statement that the culture of rice is adapted to our Gulf coast territory, and that so far its development as an agricultural product is caring for itself as rapidly as the process of assimilation can take place, and granted further that its value as a food product is beyond cavil, it brings us to the question of what we are going to do with the rice after we have made it.

The industry being an infant one, there is no question but that much just criticism can apply as to our present methods of trading. To the man from the West or the East who is accustomed to the handling of the stable grain crops of those sections, it seems that we are uselessly expensive in all that we do. Primarily, the manufacturing end of the industry is scattered over a wide range of territory, with the consequence that buyers are at sea, values are irregular, and taking our experience of this year as a criterion, parities are not maintained. It is much a case of each one for himself and the "devil take the hindermost."

Going a little below the surface, one of the principal reasons for this condition, in my opinion, is the system of toll milling. The different factories or mills look to the agriculturist to furnish them with their raw products in the operation of their plants, with the consequence that, not having direct monetary interest in the product, the principal idea of the miller is to run his

machinery so as to get the greatest possible output, when it is a fact that due to the lack of uniformity of grade, style, and character in rough rice, each lot, in order to produce the best result should be considered as to its individuality and handled accordingly. Under this system the best results do not always obtain in the manufacturing process of turning the rough into clean.

Then after the rice is ready for market, instead of the judgment of the manufacturer dictating when to sell, and how to sell, the constant pressure on the part of the owner of the goods wanting settlements and wanting money, means that the distribution is forced and influenced, not in accord with the markets or with the demands, but by the necessities and lack of judgment of the owner.

The remedy for this condition to my mind is simple. The manufacturing end of rice should do what the manufacturers of every other industry in the country do, and that is, buy their raw product and handle their output as their own goods, and this condition I believe will not be many years before coming to pass. A further advantage to accrue to the mills buying would be if, as the rice was purchased, it could be assorted out. Then the mill runs as to grade and style would have more uniformity, so that after business in a certain locality had been worked up there would be a greater certainty of supplying that trade with the goods to which it had become accustomed. I will illustrate this by calling attention to the manner in which the flour miller is enabled to advertise a certain brand and push it in a market and due to its uniformity get more money for it than he would by grinding up wheat into flour as it came to him instead of selecting it out.

I beg to say that my remarks must not be considered as being any adverse criticism of the manner and methods of any one branch of the industry, but I do believe that in the development of that industry we have got to get on the same basis as applies to, and as experience has shown to be the best basis in handling the grain stable crops of the country. It is true that New Orleans is the primary market for rice, the balance of the territory following her lead as to values, and just so long as the output is passing through her hands, just that long do we maintain prices and distribute the goods as the needs of buyers call for. This illustrates the necessity for the different mills through their clean rice men keeping in touch with each other, a difficult matter when the factories are scattered throughout a large territory, and each is trying to dispose of its product direct through its own clean rice man instead of pooling together and handling the common product through a single head located in some large center where the markets can be followed first hand, instead of through correspondence and telegrams.

I am of those who believe that the rice industry has come to stay, and that the future promises it will become one of the staple crops of the Gulf coast territory. It will not be very long before rice gets to be a staple in these United States as are our wheat and corn.

I will only touch upon the good work being accomplished by the Rice Association of America which represents the only concerted effort being made toward the increased consumption of rice, and the establishment of a rice kitchen at the St. Louis World's Fair will, I believe, accomplish much toward that end.

COTTON AND THE GENERAL AGRICULTURAL OUTLOOK

D. F. HOUSTON

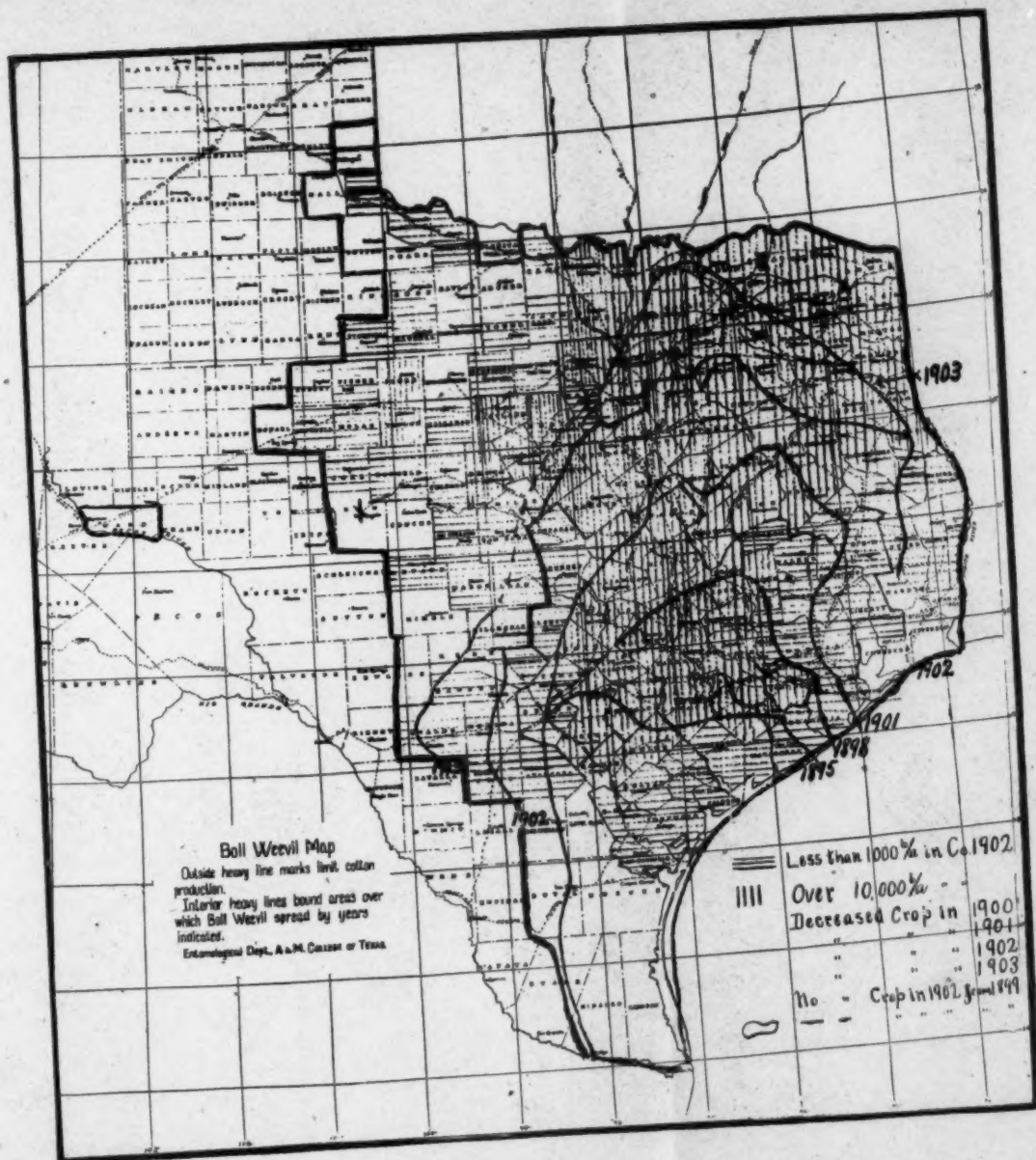
I shall not waste the time of this body in emphasizing the importance of cotton as a commodity or in discussing the unique position which it holds. It is one of the commodities which has a world-wide demand. Its production, however, is confined, for the most part, to a particular section of one of the countries of the world. Up to within the last year or two little or no apprehension was felt as to the possibility of a practically indefinite increase in its production. Conditions had been such as to justify the expectation that the South alone would be able to meet the world's demands for a long time to come. The increase in the quantity of this product from the beginning of the 19th century to the beginning of the 20th century, with the exception of the period from 1860 to 1875, had been rapid and steady, particularly so after 1850 when the southwestern trans-Mississippi territory was opened up.

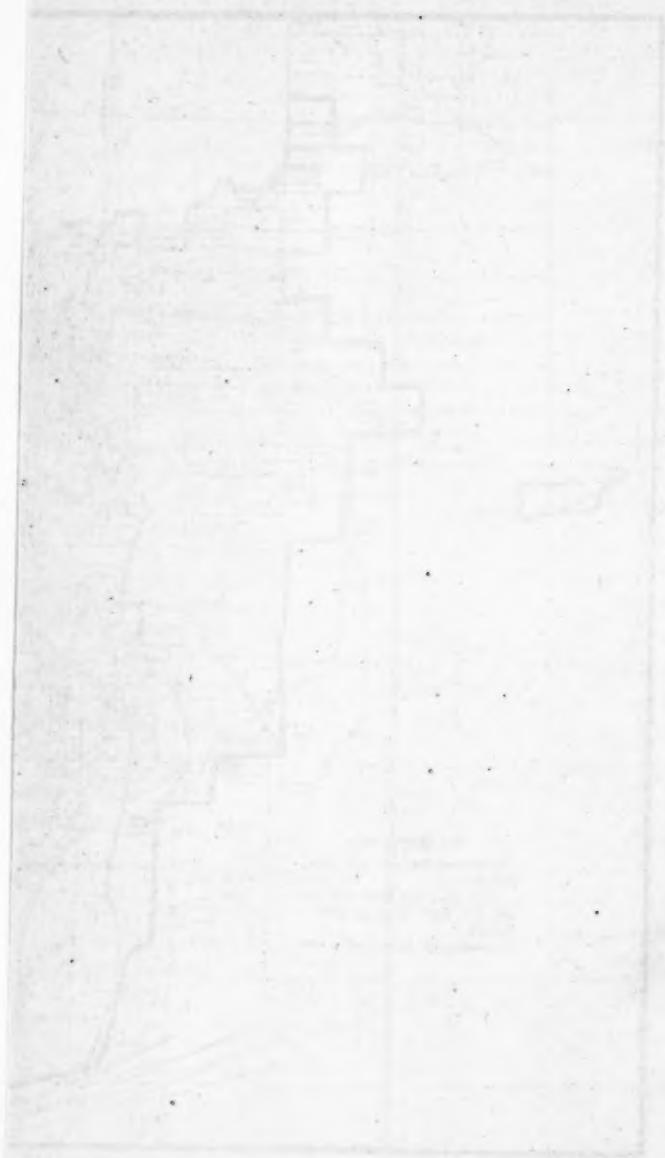
Within the newer and more fertile territory, from which the largest increase was expected, there has appeared a destructive cotton insect, the Mexican boll weevil, which constitutes the greatest menace to cotton production that the cotton farmer has had to face. And it so happens that within the short time in which this pest has been most active, unfavorable climatic conditions have prevailed over the entire South, resulting in a marked lessening of the yield in most sections. It is not remarkable, therefore, that much apprehension has

been felt throughout the world that there may be a permanent decrease in the supply of cotton, and that startling developments have presented themselves on the cotton exchanges. A careful discussion of the situation is, therefore, especially opportune.

Let us consider first the Mexican boll weevil as a factor in the production of cotton. This insect has been known to scientists for more than a generation. It was first described by a German naturalist in 1878. It is probably a native of Mexico or of Central America. It made its appearance in Texas in 1892-93, near Brownsville. Since that time it has spread rapidly, moving at the rate of forty or fifty miles a year without materially lessening its numbers over the territory as it advanced. By 1895, it had advanced as far north as a line drawn from San Antonio to Columbia, near the mouth of the Brazos river; by 1898, to the neighborhood of Navasota and Bryan; by 1901, to Waco and Palestine; and by 1903, to the neighborhood of Brownwood on the west, Sherman on the north, and beyond Nacogdoches on the east; or on the west well on towards the ranch section, on the north nearly to the Red River, and on the east to within a short distance of the Louisiana line, covering more than 5,000,000 acres of the 7,000,000 planted in cotton, affecting a region which, in 1899, produced more than 2,000,000 out of a total production in the state of 2,600,000 bales.

The rate of increase of the insect is remarkably rapid. Each female lays from 50 to 150 eggs during the course of a month or six weeks. It lives a month or more, and it is estimated that each insect will destroy two or three squares a day. Its habits are such as to render it proof against any means yet devised for its destruction. It





feeds on nothing but cotton, and entrenches itself in the squares or in the bolls where it is protected against chemicals or poisons, and from which it can be taken only with considerable difficulty. During the winter it hides in the crevices of the ground, or under bark, pieces of wood, or trash of any kind. That it can not be destroyed by any human device is practically conceded by all the entomologists. In the next few years it will certainly cover every section of Texas; and that it will spread over the cotton area of Oklahoma, Indian Territory, Arkansas, Louisiana, and ultimately over the entire South, is fully expected.

While people in their panic have probably attributed to this insect damage which has been done by other insects such as the boll worm, by diseases such as the root-rot, and by unfavorable climatic conditions, still there is ground for believing that in one year alone it has destroyed 240,000 or 300,000 bales with a value of \$12,000,000 to \$15,000,000. In seven counties running from west to east, selected from the area in which the insect appeared before 1895, the production between 1899 and 1902, decreased from 98,225 bales to 88,967 bales; in seven counties in the area in which it appeared between 1895 and 1898, the production decreased, between 1899 and 1902, from 247,579 to 129,817 bales; and in seven counties in which it appeared between 1898 and 1901 there was a decrease, between 1899 and 1902, from 279,935 to 180,071 bales. In the area in which it appeared between 1901 and 1903, the damage was not so great and there was an actual increase of production between the dates mentioned. But it is undoubtedly true that in the year 1903, over this area, the destruction has been enormous. On the

other hand, in seven counties, running from west to east, selected from the area not yet affected by the boll weevil, the production increased, between 1899 and 1902, from 151,000 to 175,000 bales, while in a second set of seven counties, likewise selected from the non-boll weevil area, the production increased, in the same period, from 197,000 to 265,000 bales. The difference between the yield in the boll weevil section and in the non-boll weevil section is too great to be explained by differences in climatic conditions. For the most part, these were substantially the same over the entire state.

Everywhere men are asking what the outcome will be. Will cotton production be discontinued in a vast and fertile territory from which the largest increases have been obtained in the last few decades, and from which the largest increases have, until recently been expected? The answer given to this question by all of the experts, and by the greater number of intelligent, practical farmers is in the negative. The prevailing opinion in Texas is that while it is probably useless to attempt to exterminate the boll weevil, a profitable crop can be raised in spite of it by the employment of approved methods of cultivation. It has been demonstrated by experiments carried on by experts of the federal Department of Agriculture and at the Agricultural and Mechanical College of Texas, that by careful preparation of the soil, by early planting, by using seeds of early maturing varieties, by keeping the fields scrupulously clean, and by persistent and late cultivation; in short, by using methods which a farmer should use, and which are not much more expensive than those that ought to be employed were the weevil not present,—cotton can continue to be raised with a profit. The

effect of such methods, it is claimed, will be to make the cotton mature before the boll weevil becomes active. It has been discovered that it does not begin to do damage on a large scale until the latter part of July or the first of August, its early or late advent and activity depending, in considerable measure, on whether there is much rain fall or general atmospheric moisture.

But still there is room for a considerable amount of pessimism. Farmers are conservative; most of them possess comparatively little initiative, and vast numbers of them find it difficult to secure the requisite equipment in the way of seed, machinery, stock, and the labor necessary to make intensive cultivation possible. The situation calls for a campaign of education by every agency that can be employed, and even then progress will be slower than many people expect. It is probable that in time each farmer will, in planting cotton, limit himself to an area which he can cultivate with scrupulous care, and that those farmers who cannot muster up the intelligence and initiative will be crowded to the wall and will be compelled to direct their attention to other crops and to live stock, with immense gain to themselves and to their communities.

Turning for a moment to the production of cotton in the South as a whole, outside of the boll weevil area, and eliminating the boll weevil from consideration, there is no reason whatever for apprehending difficulty in securing, under normal conditions, a large increase in cotton production. In each state there are still tracts of land not devoted to any crops which can be put into cotton, and it may be said with some assurance that there is scarcely a farm in the South on which more cotton cannot be raised by the employment of better methods of

cultivation. Reasons that have been assigned for the decrease in the cotton crop since 1900, such as the deterioration of seed, the migration of some farm labor to the cities, and the tenancy system may be dismissed without serious consideration. It is undoubtedly true that exceedingly careful attention should be given to the selection of seed and to cotton breeding, and that everything that can be done should be done to retain on the farm the more intelligent labor and to increase the efficiency of tenants. But it cannot be safely argued that there is anything in this direction which goes to explain the decrease in the crop since 1900. There is good reason for thinking that there has been an improvement in the cotton seed used by vast numbers of farmers. It is undoubtedly true that the agricultural population in many sections of the South has not only absolutely but also relatively increased. The statistics of the federal census show that white cash tenancy farming and black share tenancy farming give a larger yield per acre than ownership farming by either whites or blacks, and that negro cash tenancy farming and white share tenancy farming are only slightly less productive than white ownership farming, and are more productive than black ownership farming. The explanation of this probably lies in the fact that those who own, and supply tenants, are more intelligent, furnish more efficient machinery, and give more efficient direction to the labor than can the average owner. And the superiority in point of production of the negro share tenant over the white share tenant is probably due to his greater readiness to receive and carry out directions. The census of 1890 gives the following yields per acre for each class of farmer, white and black.

White: owner 0.398, cash tenant 0.403, share tenant 0.380. Black: owner 0.364, cash tenant 0.381, share tenant 0.400.

Passing to the second and more general part of my topic, the general agricultural outlook, I shall endeavor, by reference to recent developments, to suggest the agricultural tendencies and probabilities.

Speaking summarily, the South has, in recent years, made great advances which will become more marked as time passes. In the production of the old staple crops, it has made remarkable progress. The improvements in the methods of production and in farm equipment have been no less striking than the increase in the yields of the various crops. New and very fertile land has been appropriated, and land already under cultivation, has been more satisfactorily tilled. In 1860 the total number of bushels of corn produced in the Southern states under discussion, was less than 230,000,000, and it did not exceed this figure until 1890, when it reached 272,000,000, while within the next ten years it amounted to more than 378,000,000. The total tonnage of all forage crops produced in 1859 was less than 930,000, and it was not until after 1880 that the production again reached this point, while in 1899 the yield exceeded 3,200,000 tons. The total value of all live stock, reported in the census of 1860, was approximately \$331,000,000, which figure was not reached again until about 1890, while the census of 1900 reported a total valuation of approximately \$525,000,000. The foregoing figures sufficiently suggest progress along old lines.

The main advances along new lines have shown themselves in truck and fruit farming. Time will not suffice to enter into details in this direction, but the statis-

tics for Irish potatoes, which may be taken as an index of the truck crops for the South, of local market garden products, and of the principal fruit trees, will be representative. In 1859 there was a total production of Irish potatoes of 5,460,000 bushels, a figure which was not exceeded until after 1880, while in 1899 the production exceeded 12,000,000 bushels. The statistics for local market garden products are still more striking. They do not extend back beyond the XIth census. That census reported products with a total value of \$3,775,000, while the census of 1900 reported products with a valuation exceeding \$18,000,000. The development of the fruit growing interest has been no less rapid. The census of 1890 reported more than 33,500,000 apple, peach, pear, and plum trees, while that of 1900 reported approximately 67,500,000.

Interesting tendencies are revealed by the statistics of the number and acreage of farms, and of the value of farm implements, machinery and farm products. The number of farms has increased enormously, while the size of the farm has diminished steadily, and the value of farm implements and machinery has, in the last decade made a gratifying advance. The number of farms which, in 1860, was less than a half million, in 1900 was only a little less than 2,000,000 and the average size of the farm, which in 1860 exceeded 410 acres, in 1900 was approximately only 125 acres. In 1860 the value of farm implements and machinery was returned at \$75,000,000, which point was not reached again until in 1890, while in 1900 the total valuation exceeded \$122,000,000. All this contributed to the increase in the total value of farm products from \$412,500,000 in 1870 to more than \$952,500,000 in 1900.

It will be observed, speaking generally, that the South did not recover from the Civil War and the disruption of its social and economic system until about 1890. When we remember that the South, for the first time in her history, attained a normal industrial position about 1890, and that she has had only a little more than a decade under which to secure expansion under normal conditions, we are amazed at the vast results secured. The future will be a continuation of the recent past on a large and intense scale. We shall witness a remarkable growth of better farming, a large increase in modern equipment and machinery, satisfactory improvements and a rapid diversification in the staple crops and a tremendous uplifting in the intelligence and prosperity of the people.

COTTON AND THE GENERAL AGRICULTURAL OUTLOOK—DISCUSSION

GEORGE K. HOLMES: The makeshift agricultural system that forced itself upon cotton planters after the Civil War, although a necessity at that time, had various features that grew to be real burdens upon the planters, and the system was too uneconomical to last. Among these burdens were the tenant system, the crop lien, the enforced sale of cotton by the planters as soon as ginned, the want of rotation and diversification of crops, and a too large reliance upon commercial fertilizers. Under this system the planters' purchases and sales become mere transactions in barter, in which cotton was exchanged for supplies for farm and family. It is this barter, in which bookkeeping takes the place of money, that has made money so scarce among Southern agriculturists, for money does not go where it is not used.

The negro has been, and, in a less degree, still is essential to Southern agriculture, but he has dominated the character of agriculture, to its disadvantage. Ex-Governor Northen of Georgia said, in a recent address: "We have not diversified our crops, because the negro has not been willing to diversify. We have not used improved machinery on our farms, thereby economizing expenses, because the negro is not willing to use such implements. We have not improved our soil because the negro is not willing to grow crops to be incorporated into the lands, nor leave his cotton seed to be returned to the fields that he has denuded of humus and all possible traces of fertility. Because he is unwilling to handle heavy plows, we have permitted him to scratch the land with his scooter just deep enough to allow all

the soil to be washed from the surface, leaving our fields practically barren and wasted. We have not raised stock on the farm because the negro is cruelly inhuman and starves the work animals we put into his hands for his personal support. We have accepted his thriftless and destructive methods simply because under our present system we have not been able to help ourselves. If this be true, our present system in this relation is absolutely ruinous and it will not invite the residence of intelligent settlers from the outside."

With hardly an exception, the Southern farmers whose letters I have read testify that the deterioration of negro labor has become so accelerated as to be almost perceptible year by year. The old economic deduction that free labor is more efficient than slave labor is a gigantic fallacy as far as experience in the South is concerned.

Within the last few years, the negro has evidenced a marked tendency to migrate from the plantation to town and city; to railroad, mill, and lumbering camp; and to diffuse himself throughout the North. The reason for this is that the plantation negro has so deteriorated for the practical purposes of getting a living that he is finding the conditions on the upland too severe for him, and so is migrating to places where conditions are easier. In Virginia he has very largely disappeared from the farm outside of the southeastern part of the state. In consequence of this, the average cultivated farm area is limited to what can be cultivated by one family with a little extra help, just as it is in the North, and for the same reason. The migrations of agricultural negroes to the cities and to the North have gradually forced the line of small cultivation southward through Virginia to North Carolina.

White labor is supplementing negro labor in the raising of cotton with an increasing fraction. From census statistics it is estimated that approximately 40 per cent of the cotton field labor is white, and that in Texas it is fully 60 per cent. When the old Southern cotton plantation loses the negro, it will then be face to face with problems of far reaching consequences. Forces which I have not time to discuss seem to be at work to diminish the reliance of the cotton planter and Southern farmer upon negro labor. This will jeopardize the present tenant system, threaten the disruption of the large plantations, and increase the rotation and diversification of crops. The Southwest has received white labor from the outside because of its new and cheap land, but the old South will have its day in the influx of white labor, because the time is at hand when it should be seen that the cheapest agricultural land in this country is the old exhausted land of the South, with its low prices and enormous possibilities under intelligent management in the utilization of green manures, the rotation of crops, the diversification of production and wise specialization.

Railroads can help the agricultural South immensely, if they will; some of them have done so. Conspicuous examples have been set by railroads running from the Southwest to St. Louis and Chicago, and by the railroads running up the Mississippi Valley and the Atlantic coast; but among the smaller railroads and branches of the larger ones are many that so adjust their freight rates that they bring goods to the farmer, but market few products for him. Many an agricultural community in the South suffers under and because of this condition. The complaint is that freight rates for the transportation of hardly more than a score of miles

are so high that they absorb perhaps the entire selling price of farm products. A railroad that sets out to make business for itself, such as the Southern Pacific, is an everlasting example to these unprogressive railroads. I understand that through the efforts of the industrial agents of that road 70,000 families have immigrated within the past ten years to the region along its line, largely to southeastern Texas and southwestern Louisiana. Some of our states have less than this number of families. A remarkable fact in connection with this immigration is that these families come mostly from the North—from such states as Illinois and Indiana.

The cotton planter and the general farmer in the South have been in purgatory, but they are coming out. The agricultural development of the South since the census of 1890 is very marked and this in spite of a comparison with the tremendous agricultural development of the North Central states. The South, which had been backward in its corn production for many years preceding 1890, finds itself since that time with its fraction of the national production of corn increasing faster than that of any other section. The same is true with regard to wheat, sweet potatoes, cane and sorghum syrup; and to these may be added tobacco, farm-made butter, horses, mules and swine. The South occupies a second place in the rate of increase of production in comparison with other sections, in buckwheat, hay, apple and peach trees, cattle other than milch cows, and farm-made cheese. Of course, if rates of progress for the different states were examined, it would be found that the rate of progressive production in the South is considerably localized, more particularly in the southwest than elsewhere; but the older part of the South is

by no means out of the race, although it has no virgin soil to exploit. The South is making great progress, too, in enriching the soil by means of leguminous crops, such as cowpeas, thereby supplying nitrogen and humus and breaking away from the sole dependence upon commercial fertilizers. Notwithstanding the persistence of cotton as the one crop of the plantation, agriculture is diversifying in the South in the direction of fruits and vegetables, live stock, dairying, tobacco, rice, and cane and sorghum syrup.

Evidences of a new life in agriculture appear in numerous places. A dozen years ago, Southern farmers made their first noticeable attempt to produce their own supplies, and since that time progress has been made in this direction to an extent sufficient to be evident in the census of 1900. A large independence in this respect was enjoyed by plantations half a century ago; they are now returning in a measure to that independence. There is no part of this country where the farmer can become so independent as he can in the South—independent in the production of that numerous class of products comprehended within farm and family supplies.

A word in conclusion in regard to the future of cotton. The plans of British, French and German cotton manufacturers to have cotton raised in Africa and perhaps South America in quantities sufficient to become a large export crop, seem plausible enough if we ignore one essential factor. The conditions of climate and soil are ideal and cotton grows perhaps spontaneously in the regions toward which their attention is directed, but they have overlooked the necessity for men who will engage in arduous and continuous labor. The reliance upon labor in Africa must be upon native negro labor, and how

slender this reliance is for such an undertaking as cotton raising, should be apparent to any one who has read the numerous accounts of white men who have come in contact with it. The Transvaal Labor Commission, appointed to examine a critical state of affairs on account of the scarcity of labor, has just reported that the demand for native labor for agriculture in the Transvaal is largely in excess of the present supply and that there is no adequate supply of labor either in southern or central Africa to meet the requirements of agriculture, mining, and the various industries in that colony. A plan to place the negroes under a system of peonage has been earnestly advocated within a year in South Africa and England. Cotton could be produced in large quantities in Brazil if labor were at hand for the purpose, but in that desert of laziness the production of surplus cotton is out of the question, although all other requirements are present and ideal. It need not be expected that Egypt and India will increase their production of cotton faster than is necessary to maintain their present relative position in the world's supply. Their labor has been on trial in this direction long enough to demonstrate what it can not do.

On the other hand, the cotton belt of this country has by no means reached its limit of production. Under a rotation of crops, leguminous manures, and an improvement of seed, the present cotton crop of this country can be doubled upon the present number of planted acres. If the boll weevil does not prevent, the South will continue to supply more than two-thirds of the world's cotton, and the welfare of the cotton producer demands that the prices shall be high.

THOMAS N. CARVER : Does the rotation of crops check the boll weevil ?

D. F. HOUSTON : The only thing I know of is to stop

planting cotton. I have here some specimens. I doubt if stopping the planting of cotton for four or five years would stop the boll weevil.

WILLIAM C. STUBBS: I beg to say a few words about the boll weevil. It can live only on the cotton plant. If you destroy the cotton plant you will destroy this pest. The question will be considered at a meeting to be held in New Orleans some time during the winter. A bill is to be introduced in Washington, and we are going to fight the weevil heartily. We are going to fight it on the lines of the railroads and streams, to keep it out of Louisiana. We have the assertion of Prof. Wilson that the treasury of the United States is the best money chest in the world, and yet if a man had all of that money there would not be enough to fight the boll weevil. We will try to hold him in check.

The insect is not a new thing. During our southern war, Cuba tried to raise cotton, yet there were two or three wild cotton plants producing boll weevils as fast as it was raised. That effort was a failure. Since then it has been introduced all over the parishes where cotton is raised. The boll weevil is all over Mexico, except in a single state which is quarantined by a hundred miles of non-cotton country.

We have to fight to keep it from spreading. Texas has special commissions. One of the speakers said that 60 per cent of the cotton growers are white men, while in Louisiana 60 per cent are negroes. We have all the facilities in the world for flooding the state. I can go from here to fifty-five parishes by water. But we don't want to run the risk of flooding him out of Louisiana. I believe this to be the most serious danger that ever confronted the cotton industry. If it is permitted to ravage our state our cotton industry will be reduced to 8,000,000 bales.

TOBACCO

LAWSON H. SHELFER

The subject "Tobacco" is of great importance to the agricultural people of the United States. While tobacco is not a necessity, humanity has taken to the use of it as a luxury, and it is needless to say that from the crowned heads of the highest nations to the lowliest of our humanity the use and relish of this luxury in its various forms is almost universal. There are millions of dollars spent annually for this luxury and while the weed grows in the tropics, semi-tropics and even in the torrid zones, still there are only special places that grow a special tobacco. There are three important features to tobacco culture, the first being soil that is adapted to the special weed, second, climate, and third, experience in handling.

SOIL.

The most important part of tobacco culture is the soil. While the plant will grow luxuriantly on any soil where vegetables will grow, still the soil gives the leaf its quality and flavor, so a special soil is needed for every kind or variety of the tobacco leaf. In the chewing tobacco section of the United States is a large area that grows this variety, still there is only a small amount of the soil that will produce a quality of high commercial value. Sometimes the soil can be stimulated with a fertilizer that will greatly improve the quality and at the same time it will only improve the quality on the soil most adaptable for the special plant. You can take a soil that is adaptable to a special variety of tobacco and that will grow a fine leaf of a high commercial

value and in a stone's throw will be a soil that will produce a leaf nearly worthless. Take an old tobacco section, such as Cuba, where the highest grade cigar tobaccos is produced, and you will find that it can grow a high grade only on a small section. Here and there, sometimes in a little narrow strip, while the adjoining lands produce a luxuriant plant of tobacco which is worthless to the trade. This applies to all of the cigar tobacco sections of the world. Florida, Connecticut, Ohio, Pennsylvania, Wisconsin, Texas, and in all the states that produce a cigar leaf, you will find the same conditions, the choice soil in every section where the cigar leaf is produced being very limited. In the same way you will find the chewing tobacco, smoking, cigarette and snuff varieties have a special locality or a special soil that will bring the highest prices, so there is no hesitation in stating that the soil is the foundation of the cultivation of tobacco of any variety. This also applies to almost any class of agricultural products. The agricultural people of the United States to-day do not devote enough time to classifying the soil and to planting the crop that is best adapted to it. That is why the United States Department of Agriculture, through the Bureau of Soils, has devoted so much time during the past few years to the analysis and classification of the soils of different sections, and to-day the most essential point to take from an agricultural view, is to have your soil analyzed and see if you can supply by chemicals what is needed for the agricultural crop that you may want to grow.

CLIMATE

The climate has a great deal to do in itself and it takes different climatic conditions to raise different crops

successfully. Tobacco will grow in almost any climate from almost any seeds, wherever any vegetation will grow. It does best in the tropical or semi-tropical climates, and the highest valued tobacco from a commercial standpoint is produced in such climates. Still valuable tobacco can be grown further North than any grain crops. Climate and soil make the different varieties of tobaccos. For instance, you can take seed of a pure variety from the choice section of Cuba and the same from the island of Sumatra, and then from any state in the Union and plant them all in Texas or in any other locality, and they will eventually run into one variety which is most adaptable for that climate and soil. If the climatic condition was all that was necessary the entire island of Cuba would produce the famous Vuelta Abaja tobacco, or the entire island of Sumatra would produce the famous Delhi Sumatra wrapper, or the entire state of Virginia would grow the high-priced chewing tobacco wrapper, and the same would be true of any other state with respect to its most famous variety. So it is plain to say that the climatic conditions go with the soil.

While dwelling on this point it will be well to point a word of warning to the tobacco growers of the United States; that is, if you are growing a special variety of tobacco. Either cigar filler, wrapper, chewing tobacco (wrapper or filler) snuff or cigarette tobacco grow from the highest grade seed from the section that is most adaptable to the variety that your soil and climate is suited to. Take the cigar tobacco, with which I am more familiar than any other. We want our filler tobaccos of the Southern states or the semi-tropical climate raised from seed from the Vuelta Abaja district of Cuba, for the reason that there is where the

world's highest grade filler tobaccos for cigar purposes is raised. Wrapper tobaccos can be grown in this climate from the same seed that is used for filler as it is in Cuba. Still there is a great deal of our soil more adapted to raising a high grade wrapper from the Sumatra seed, which should come from the Delhi district of Sumatra. If you are going to raise a high grade of chewing tobacco, go to the section of Kentucky, Virginia or North Carolina that grows the best commercial tobacco and get your seed there. The same applies to any tobaccos of any of our states. We can raise a thinner fiber of wrapper leaf of the various grades by erecting a lattice frame and by covering it with cheese cloth, or coarse gauze for shade. This will hold moisture near the surface and regulate the temperature so as to give a more rapid growth and thinner fibered plant. This is desirable only for the various varieties used for wrapper purposes.

HANDLING

Handling is the third and one of the most important of all points to remember. You can take soil, climate and seed, and without skill you will make a failure; or you take either of the three above mentioned points—soil, climate, or skill—and without all three combined, the whole is a failure. The cultivation of tobacco of various kinds, in various sections, is very simple to any man who is familiar with any branch of agriculture. Still, there is a great deal of science, even in growing plants, transplanting and cultivation. But any practical farmer who can grow a grain or vegetable crop of any kind, can produce tobacco to this stage. When the time comes for topping the plant, it is necessary to have a practical man to understand just exactly the number

of leaves to top, and know what soil and climate will mature perfectly. This applies to all varieties of tobacco and to all sections. In other words, it is necessary to gain some experience from the local growers of any section which produces a high type of tobacco that is adaptable to their section.

As to the ripening and harvesting of the plant, it is also very necessary to have a person who has a practical knowledge of the local plant of his section or of the climatic conditions of the country.

After the tobacco is harvested, the burden is not entirely over. It takes experience of handling the different varieties in the different sections so as to get the best results. This is why the Department of Agriculture of the United States is spending so much time and money in experimenting to obtain the best methods of preparing for the market every variety in every section.

COMMERCIAL VALUES OF DIFFERENT TOBACCOS

The United States today, while producing enormous amounts of tobaccos of various kinds and used for different purposes, imports from Cuba filler tobaccos for which we pay the Cuban agriculturist about eight million dollars per annum. The import duty on this tobacco being five or six million dollars, making a total of about fourteen million dollars for filler tobacco, which could be produced in Texas, Florida, or where there are similar soils and similar climates. This would mean more to the agricultural people of the state of Texas than the revenue derived from almost any other crop. The soils and climatic conditions of Texas will produce this filler tobacco. Notwithstanding that we compete only with the filler tobaccos of the island of Cuba, we

compete with the wrapper of Sumatra. This latter amounts to millions for the importation, while we have soils where we can apply the skillful methods of our advanced American people, and by using the above mentioned methods of artificialing by shade, we can give this amount to our American agriculturists.

Notwithstanding that there are a great many cigars imported in their manufactured state from Cuba, Mexico and other countries, we American farmers can compete and hold our own by paying strict attention to, and by studying out the conditions, the needs, and wants of our American people.

TOBACCO—DISCUSSION

J. B. KILLEBREW: Tobacco belongs to the nightshade family, which furnishes the potato, the tomato and red pepper, all of American origin. There are four species in America belonging to the genus *Nicotiana*, two of which, *N. tabacum* and *N. rustica* are extensively cultivated, and the *N. quadrivalvis* to some extent by the Indians in the Northwest. To the former species all the numerous varieties of tobacco now grown in the United States and Cuba may be referred; to the second, *N. rustica*, belong the Turkish and Hungarian tobaccos, and probably the Latakia tobacco of Syria. The Shirez tobacco (*N. Persica*) is said to be a native of Persia, and possibly it is the same species that is grown in China. In flavor it resembles the Latakia, but not in its habits of growth. Some of the varieties may have descended from one species or several, inextricably mixed by crossings and variations. In no other plant is the variability of the species involved in a labyrinth of greater difficulty and manifests itself in so many ways. Soil, climate, situation, reciprocal crossings of varieties and interbreeding, all go to produce an offspring, varying in size, structure, delicacy of fibre, fragrance, porosity, color of leaf, and capacity or incapacity to secrete resinous or gummy substances. Kolreuter, quoted by Darwin in his work on "Variation in Plants and Animals under Domestication," speaks of five varieties of common tobacco that were reciprocally crossed, and they bred plants intermediate in character and as fertile as their parents. When these five varieties were crossed with a different species, with a single exception they yielded sterile hybrids.

Tobacco, like wheat, adapts itself to climate, soils and situations. In New England, Pennsylvania and Wisconsin, tobacco is ready for the harvest within eight weeks from the time of transplanting to the fields, but in Virginia, Kentucky, Tennessee and North Carolina, from 110 to 140 days are required to ripen the leaves, except in the Champlain districts.

The Havana seed tobacco is now grown extensively in all the localities in the Northern states where twenty-five years ago only seed leaf varieties were cultivated. This Havana seed is the result of four successive generations from the original parent seed of the Havana variety. The modification brought about by climate and soil gives a distinct variety, longer in leaf, but with diminished fragrance, as compared with the original Havana. The leaves are finer in texture and more fragrant than the seed leaf varieties. If the seed from the Havana seed variety be planted in succession for several years, the tendency of the plant is towards the larger and coarser inodorous seed leaf. In this, one may see the effects of climate and soil in producing variations in species. Flavor is due to climate; texture and color to soil.

The most striking illustration of the variability of species produced by soil is that of the yellow tobacco in Virginia, North and South Carolina. In 1852, two brothers living on a sandy ridge between two affluents of the Dan River, in Caswell County, North Carolina, planted a crop of tobacco. The soil was thin and sandy and almost destitute of any plant nutrition. It was light in color, very sandy in character but friable and highly porous. The tobacco plants set out on this soil were grown in seed beds, sown with varieties that had produced heavy dark types. After being transplanted

they grew very slowly. As the leaves developed and expanded it was seen that they changed in color from a light green to a golden yellow. In this condition, the plants were harvested and cured with open charcoal fires in closely chinked log barns. The leaves retained all their rich golden or lemon hues after being cured and they developed an aroma of a honey-like sweetness. When the tobacco was carried to market it brought a fancy price. The manufacturers of tobacco in the North, after that event, soon learned of the fitness of this yellow tobacco for making the best plug and it sprang into active demand. With this demand, came increased acreage and it was soon ascertained that all whitish or yellowish sandy soils in the Piedmont region would grow this handsome type of tobacco. The production soon extended into Person, Granville and Rockingham counties in North Carolina, and Pittsylvania and Halifax counties in Virginia. It was then carried to Buncombe and other counties in the mountainous division of North Carolina.

After 1880 its cultivation in a tentative way was begun in the Champlain districts of North Carolina with remarkable success. It was grown on the Potsdam sandstone soils and granitoid soils of eastern Tennessee, and in South Carolina. Wherever the conditions of sterility prevailed in a soil with a whitish color, there yellow tobacco could be grown successfully. Any ferruginous matter whatever in the soil is fatal in the production of this type. Portions of the same field, where trap-dykes were found with a residuary red soil, were carefully shunned by the growers of yellow tobacco.

The theory in growing the best types of yellow tobacco is that the soil is a sponge, which must have the capacity to receive and retain just enough fertilizing

matter to support the plant until it reaches a proper size. After this it is best that the fertilizers be exhausted so that the plant may go into a gradual decline in its vitality, like the hickory leaves in autumn, growing more and more yellow, more and more delicate in tissue, more and more beautiful and storing up more and more sweetness until it is harvested. It was soon ascertained that too much manure applied to the soil would destroy the best qualities of the leaf, vitiate its fragrance and diminish its brightness of color.

The stupendous economical effects of the growth of yellow tobacco in North Carolina are well worth our attention. The prices of old worn out lands, once perfect pictures of sterility, desolation and unfruitfulness, have advanced from fifty cents per acre, thirty years ago, to thirty and fifty dollars per acre at the present time. Oftentimes from \$150 to \$300 are made from a single acre of tobacco. Great centers of trade have sprung up, new lines of railroad built, and the manufacturing industry has advanced more rapidly in North Carolina than in any other southern state. The profits from the yellow tobacco crop laid the foundation for the building of a large majority of the 7000 manufacturing establishments now in North Carolina, of which 679 are for textiles and 101 for the manufacture of tobacco.

Another remarkable variation of species, due both to soil and climate, is the White Burley variety, which, in its results, has changed the whole character of the agriculture of central Kentucky, converting a large portion of the finest blue grass and stock-breeding districts in America into a tobacco region. At first the plants grow slowly, but after becoming well established they advance rapidly, attaining magnificent size and displaying great vigor. They ripen two weeks earlier than most

plants. When cured by atmospheric influences the underside of the leaf has a whitish tinge and the upper surface has a beautiful reddish golden color. Its culture has extended into all the rich counties of central Kentucky, as well as into those of southern Ohio. The soil best suited to its growth is a blue grass soil, gray in color, rich in humus, the residuum of the disintegrated Trenton limestones.

The variety has proved to be a most profitable one, with two sub-types; the heavy used for manufacturing plug, and the light for a cutting leaf. Both types are very popular with manufacturers, because of their absorptive capacity. The White Burley tobacco is low in nicotine having a content of about 2.80 per cent. while the rich heavy shipping types have a content as high as 5.60 to 6 per cent. This low content of nicotine made the White Burley tobacco exceedingly popular with American consumers because of its mildness and its less injurious effects upon highly organized nervous constitutions. Yellow tobacco carries a still smaller per cent of nicotine, but with less absorptive capacity. Three-fourths of the chewing tobacco, both plug and fine-cut, consumed in America is manufactured from the White Burley and the yellow tobacco types. The White Burley is now a distinct variety, as much so as the seed leaf, and is what Darwin calls an incipient species, as also is the yellow tobacco.

There is a well-defined correlation between the color of the soil and the color of the tobacco grown upon it and also between the constituent elements of the soil and the quality of the cured product. It has been mentioned how the pale yellowish soils grow a tobacco of a yellow color; how the grayish soils of the blue grass region will effect the color of the White Burley. This

latter type planted on red soils will show more brown or red in the cured leaves. The rich, dark, heavy shipping tobacco is grown on reddish or chocolate colored soils, clayey in composition, compact and heavy. The color of these soils is due to the presence of iron oxides. The more heavily manured such soils are, the darker and stronger the tobacco. This dark tobacco is the richest of all types in nicotine, gummy substances and oils. It is heavy of leaf, with small midribs and delicate fibres.

The leaf is soft, pliant, oily and silky, resembling to the touch a kid glove. Its pores are filled with gummy substances to such an extent as to impair its absorptive capacity. While the co-efficient of absorption for the White Burley types is 2.60, that of the heavy tobacco is only 1.48; that is to say the White Burley will absorb about twice as much water or sauces with which it is treated in its manufacture as the rich, heavy shipping tobacco.

A light colored soil, whether of arenaceous or clayey material, will yield a product that will cure to lighter colors than that grown on soils of a darker color. Tobacco grown on sandy soils is more porous but is much coarser than that grown on clayey soils. Newly opened land, or what is called in the South "new ground," whatever its character will mature a crop of tobacco quicker than old lands of the same general characteristics and the product will be lighter in color.

Perique tobacco, so strong in the essential elements of tobacco, is almost black in color. It is grown in the vacheries of Louisiana, the soils of which are a dark alluvium, rich in humus and plant food. These vacheries are but little elevated above the swamps with which they are surrounded. The dark color of the tobacco is due largely to the method of curing, which is done by

the frequent reabsorption of its juices after being heavily pressed. Indeed it is said to be cured in its juices.

Situation has much to do with the quality of cured tobacco, other things being equal. A southern exposure will make a tobacco lighter in body, brighter in color and with less gummy material in its composition. A northern slope, receiving less sunlight, will require a longer period for bringing the tobacco to maturity. It has more time for storing up gummy substances. An eastern exposure will make tobacco intermediate between that grown on the northern and southern exposures, while that grown on western slopes will be more like that grown on a southern slope, as it receives more of the heat of the sun than that grown on an eastern exposure.

If time permitted, I might go on and tell how variant are the tastes and fancies of the different nations in the selection of the types of tobacco to be consumed by them. The Norwegians and Swedes, for instance, want the strongest tobacco grown, which they are said first to chew, then to smoke, and then to snuff the ashes. The Germans want the "black fats" and also a sweet tobacco, of fine stem and fibre, cherry red in color or mottled with yellow. It must be porous so as to take in the sauces with which it is treated in its manufacture. This is known in the American markets as the German saucer. The French requirements call for a milder red tobacco, or the White Burley types; the Italians want tobacco of a dark brown color, strong, smooth and silky in texture; the Austrians want a type of solid fine texture and glossy sheen, of uniform brown color, tough and stretchy; the Spanish take the lowest grades of lugs and light types; the English take many sorts, but one essential requirement is that they must be absorb-

ent, strong and elastic in texture, that the tobacco may be spun into rope-like strands. The negroes of Africa take the longest tobacco that is shipped from America. This, they make into a large cigar, not less than twenty-six inches in length, soak it in lard or palm-oil and then the whole tribe sit in a circle and smoke until they become deliriously intoxicated. Nearly all foreign nations prefer tobacco cured by fire. The Americans prefer that cured without fire or smoke.

No other product that enters into commerce is taxed so heavily as tobacco. England levies a tax of 77 cents per pound when it contains 10 per cent of moisture; 85 cents per pound, when there is less than this amount. This is from twelve to fifteen hundred per cent on the prices which farmers receive. Norway, Sweden, Switzerland, Holland, Belgium, and Russia all levy heavy taxes. France, Portugal, Italy, Spain, Austria and Turkey make a monopoly of tobacco. All tobacco is sold directly to the governments last mentioned, is manufactured by them and sold to consumers. France, however, in order to accommodate her thousands of guests, will permit the introduction or rather the importation of tobacco for the private use of the importer upon the payment of \$694.80 per hundred kilograms. This is \$3.15 per pound and is probably the highest duty ever paid upon any article of consumption. These countries making a monopoly of tobacco are called *Regie* governments.

WILLIAM H. GLASSON: I come from the part of North Carolina referred to by Mr. Killebrew on account of the infertility of its soil and I was, therefore, much interested in what he had to say about the effect of the introduction of the culture of bright tobacco on the

prosperity of that region. A striking illustration of the development based upon the culture and manufacture of this plant is seen in the present city of Durham which was, at the close of the Civil War, a very unimportant railway station near which Sherman received the surrender of Johnston's army. Then it was the home of a few scattered families. To-day it is a widely known city—typical of the new manufacturing South—and containing with its several suburbs from twelve to fifteen thousand people. This growth has been based upon the bright tobacco industry, supplemented by the manufacture of cotton goods.

An interesting story is told of the way in which the fame of Durham tobacco was first spread abroad. The manufacture had already been begun in a small way when Sherman's army arrived at Durham. It is said that some of his soldiers broke into a factory or storehouse where the bright leaf tobacco was kept, and helped themselves. This proved so satisfactory that after they had gone North they began to send back to Durham from all parts of the country, orders for tobacco. Such orders materially aided in the growth of the Durham industry. Johnston's army surrendered to Sherman, but Sherman's men were taken captive by Durham tobacco.

THE COTTON INDUSTRY

D. A. TOMPKINS

A very brief summary of the history of cotton production in the United States is taken from my book, "Cotton and Cotton Oil," as follows :

"For the ancient history of cotton, dating 1000 years before Christ, the practical man of to-day cares very little. Even the minor details of its introduction into the United States possesses only historical interest, and these will be taken up only to illustrate the evolution of the industry.

"The early colonists naturally experimented on their new found soil with all the divers seeds that they could obtain from all parts of the earth. Thus, cotton became an early experimental crop, beginning in Virginia about the year 1600, and continuing in all the southern latitudes for nearly two hundred years before it came to be seriously regarded as a useful crop.

"During this epoch a great army of hand weavers had sprung up in England, and it was becoming a serious problem with them to get yarn to weave.

"In all times and places, when there is a serious demand for any invention, the genius of the age soon develops and perfects that invention. In 1767 James Hargreaves invented in England the spinning jenny, by which one operative could run as many as twenty spindles, instead of one, as theretofore. This was successfully improved by Arkwright and Crompton in England, and others, so that it soon became an easy matter to provide yarn for the hand weavers. After the power loom had been introduced by Cartwright, also in England, in

1785, the world's consumption of all kinds of yarn increased immensely, and thus the demand for raw textile fibres was a constantly growing one.

"The American colonists took a growing interest in cotton production and made every effort to meet the demand from the mother country, and also the new demands of the new independent colonies.

"In 1786 Governor Tattnal, of Georgia, received some Sea Island seed from the Bahama Islands, and encouraged its production in the coast region.

"About the same time a Mrs. Burden, of South Carolina, promoted its growth on the sea islands of that state.

"Several difficulties prevented the rapid spread of cotton culture in those days. Scarcity of labor in the new country, due to the tedious process of harvesting or "picking" was an important factor, but the prime difficulty was in separating the useful lint from the then useless seed. This work was done entirely by hand until the ancient roller gin was brought over.

"As in the invention of other machinery, a crying necessity stimulated genius. The roller gin was already in use, and worked well for Sea Island cotton. In 1793, Eli Whitney, then living near Savannah, Ga., invented a cotton gin, comprising many of the features of the gin now in use for upland cotton. In 1794 he obtained his patent. In 1793 Hodgen Holmes, of Augusta, Ga., invented the saw gin, an improvement on Whitney's machine. In 1796 he obtained his patent. Thus in the period from 1793 to 1796, the saw gin became a standard machine, and an epoch maker in the history of cotton.

"The effect of this invention upon the cotton production of the country was wonderful. As soon as a few of these machines could be made and put upon the market,

it was seen that with the available labor it was easy to increase the cotton production many fold.

"In 1790 the production of cotton was equivalent to 3,000 bales of 500 pounds each, and in 1798, about the time the use of saw gins became general, the production was increased to an equivalent of about 30,000 bales of 500 pounds each.

"It soon became apparent that the productiveness of the soil would justify much more cotton planting than the available labor could handle, even with the help of the cotton gin. This idea fostered a great importation of negro slaves, and thus the growth of slavery and the increase of the cotton crop were simultaneous, each being sustained by the other. This material result was in opposition to a strong sentiment against slavery.

"The cotton crops steadily increased on this basis, building up and enriching an agricultural population which became an aristocracy in the southern United States. The cotton crop had grown to 4,000,000 bales in 1861, being mostly produced by the labor of the 4,000,000 slaves.

"From 1861 to 1865 the Civil War interfered with agricultural operations so that the average annual production during that period was reduced to a half million bales. The Civil War resulted in the abolition of slavery. The ill-advised enfranchisement of the slaves who were led by dishonest adventurers, induced a condition of political and industrial disorder. This condition retarded the recovery of the cotton growing states from the disastrous effects of the war, and hence it required about ten years after the war for the cotton planters to again reach a production of 4,000,000 bales. Since that time, the crop has continually increased, reaching to nearly 10,000,000 bales in 1900, as exhibited by the following table."

The following table showing the growth of the industry and prices obtained in different periods is taken from the same source.

THE PRODUCTION AND PRICE OF COTTON FROM
1790 TO 1900.

Year.	No. Bales 500 lbs. Gross.	Price per lb. in New York.
1790-----	3,000-----	26.0
1791-----	4,200-----	26.0
1792-----	6,300-----	29.0
1793-----	10,400-----	32.0
1794-----	16,700-----	33.0
1795-----	16,700-----	36.5
1796-----	20,800-----	36.5
1797-----	22,900-----	34.0
1798-----	31,200-----	39.0
1799-----	41,600-----	44.0
1800-----	73,000-----	28.0
1810-----	177,000-----	16.0
1820-----	331,500-----	17.0
1830-----	669,800-----	10.0
1840-----	1,737,700-----	8.9
1850-----	2,083,800-----	12.3
1860-----	4,668,900-----	11.0
1865-----	250,000-----	80.0
1870-----	2,862,300-----	24.0
1880-----	5,449,200-----	12.0
1890-----	7,311,400-----	11.5
1900-----	9,436,400-----	8.7

It may be said that the development of cotton culture went from a mere beginning to 10,000,000 bales in the 19th century. The value of 10,000,000 bales on to-day's market is \$600,000,000. In the latter half of the century the seed have been made the basis of an industry yielding products worth \$100,000,000.

There were those who thought that slave labor was essential to the continued development of cotton production. The important inventions, chiefly those of Whitney and Holmes, upon the basis of which cotton production was made profitable, were all made before

slavery became dominant. No other improvements were made until after the abolition of the institution. Since that time, great and continued progress and many important inventions and improvements have been made. Events since the dis-establishment of slavery have shown that slave labor is not essential to produce cotton. It transpires that the institution of slavery not only prevented the development of manufactures but dried up those which had been established before slavery became the dominant influence in the South. In the first decade of the 19th century Virginia, the Carolinas and Georgia led the rest of the United States in manufactures. By 1850 the manufacturing interests of the slave states had been reduced to nearly nothing as compared to those of the free states, thus limiting the occupations of the people to the production of cotton, tobacco, sugar and rice with slave labor.

I conceive that slave labor never has been of advantage in the development of cotton production. Laws necessary to the maintenance of slavery drove out the free white labor, hindered and ultimately stopped immigration. This element emigrated very largely as slavery grew in importance and influence. Throughout the first half of the 19th century there was a tide of emigration from what had been the manufacturing sections of the slave states to what was then the Northwest, now comprising the states of Ohio, Indiana and Illinois. In this tide were the Harrisons, Thurmans, Stevensons, Lincolns, Cannons, the present speaker of the national House of Representatives being one of these, and many, many others. Another tide of emigration was to the Southwest, this being composed of those who believed in slave labor and who required more land or new land to work upon.

Because of this emigration the slave states did not grow in population and wealth in proportion to their resources. Staple crops was all that could be depended upon, and while the system made a few people rich, it destroyed those markets which manufactures furnish for perishable farm products and therefore made it impossible to produce cotton so cheaply as in an environment where farm products have cash markets.

Since the abolition of slavery there has been developed a large and important industry based upon cotton seed as a raw material. The cotton seed products are cotton oil, cotton seed meal, linters and cotton seed hulls. The aggregate value of these is now about \$100,000,000 annually. The hulls and meal are very superior feed for cattle and the value and economy of this feed has brought about the development of the business of raising and fattening cattle. At some of the oil mills, several thousand head of cattle are annually fatted for the markets. In the environment made by slavery, this large source of wealth would probably never have been found and developed.

The invention of the cotton gin by Whitney and Holmes is the basis upon which the development of a large production of cotton was made possible. Patents were issued for these inventions in 1794 and 1796. Up to this time the Southern states had been settled and developed on lines exactly parallel with the settlement and development of the Northern states. The South was attractive to the European. Slavery had existed of course but very much as it had in New England or Pennsylvania. Manufactures flourished, commerce was prosperous, and all the conditions were about the same as in the other states. When the national government was formed,

Virginia headed the list of states, Pennsylvania came second and North Carolina third.

The cotton gin made cotton planting so profitable that the slave became of great value as a laborer. Where cotton would grow the slave was put to work in the cotton field. Most of those in the rest of the United States were bought and the slave trade was made brisk by the demand for slaves direct from Africa. The laws soon began to take the shape most favorable to cotton planting with slave labor. The manufacturers of wool, of iron, of wagons, and other articles became interested in the new movement and invested money in land and slaves instead of in the extension of their factories. The free labor was driven from the country or to a life of poverty on poor land.

In the new situation existing to-day we find the following conditions :

(1) Manufactures have been re-established and the manufacturing populations make markets for perishable farm products and these incidentally reduce the cost of cotton.

(2) Commerce has again become prosperous and this sustains transportation, thus enabling commodities to reach markets quickly and cheaply.

(3) All influences favorable to emigration are gone and emigration has practically ceased.

(4) All influences adverse to immigration are gone and large numbers of people are actually coming into the cotton growing states from the North. The conditions are very favorable for the European immigrant.

(5) The maintenance of the fertility of the land by the use of commercial fertilizers is now well understood and there is an enormous business in commercial fertilizers carried on under state control.

(6) The price of cotton is high enough to encourage its production alone on a farm. With the new markets for perishable farm products in addition to high-priced cotton, farming has become a most attractive proposition in the cotton growing states.

I have in the past pointed out that America must make an abundant and reasonably cheap supply of cotton or some other parts of the world would supplement her crop and take away the practical monopoly she enjoys. Already Egypt and India are producing more cotton than we did thirty years ago. I conceive that conditions are now more favorable for the economic production of cotton in the United States than ever before. The growth of the production in Egypt and India has been during a period of confusion and re-adjustment of political and social conditions in the cotton growing states. From this time forward good government and political order seem assured. As slavery was an adverse influence here, so the social conditions in Egypt and India handicap them in their competition with us under our new conditions of freedom and education.

It has been suggested that the new manufacturing interests are drawing so much labor from the farms that our production of cotton must of necessity be checked. This is within limits true. In the state of North Carolina, fifty thousand people, practically all natives, are now working in cotton mills. Probably as many more are employed in furniture factories, saw mills, cotton mills, on railroads, and or are in other ways connected with the new developments. If the same number has been employed in new developments in ten cotton states, this would represent a million people who have left the farms. This has relieved the cotton farmer of a tremendous

competition and has also made markets for his products other than cotton.

This makes a very attractive condition for the European immigrant and by the new environment of freedom and educational facilities the European immigrant will surely be attracted. I have no doubt but that the United States will continue to lead the world in cotton production and in future, supply at a fair price, an ample quantity of the staple to meet the demands of the world.

The influence of the cotton gin on cotton production was incalculable. We have come now to a situation where a successful and economic picking machine would be of incalculable value. It costs now about \$100,000,000 to pick the crop. The picking is done with the fingers and the strength of the picker is wasted in leaning and bending the body. A machine to which man power might be economically applied ought to reduce the cost of picking to \$50,000,000, and one to which mule or horse power could be applied ought to reduce the cost to not exceeding \$20,000,000.

An essential prerequisite for the maintenance of the present production of cotton and its further development is to keep the markets of the world open to American made goods. It would seem as if our access to Chinese markets, especially those of Manchuria, is now seriously threatened by Russia and this in violation of treaty agreements made between the allied nations at Peking after the Chinese War.

Those who have given special study to this subject express great alarm lest Russia not only drive us out of Manchuria but ultimately out of all China and the entire Orient. These claim that with Manchuria gained, Russia's position in the Eastern markets would be so

strengthened that she could more easily take each succeeding step until the whole territory is covered. Then by the control of enormous populations, she could command the political control of the world. If these apprehensions are true, we have in this country, the farmer and manufacturer alike, a far greater interest at stake in the Japan-Russia controversy than our government appreciates. The value of an Isthmian canal would be tremendously diminished if we were to lose our markets in the Far East.

In the matter of slavery we were not wise. Through that system an error insidiously crept upon us which nearly wrecked our progress before it was fully corrected. In regard to preserving and extending our markets it is to be earnestly hoped that our government will not remain supine in any case where action is needed to preserve conditions necessary to the maintenance and further development of our cotton industry both in the field and in the factory.

THE COTTON INDUSTRY—DISCUSSION

C. C. THACH : Though deposed from time to time by various economists and up-to-date agriculturists, cotton was never more of an absolute "King" than to-day. The world-wide scramble for the staple, the phenomenal leap in price to the highest mark since the years immediately succeeding the Civil War, the fierce struggle for the control of the market, the grave apprehension as to the adequacy of future supply, as to labor, as to the boll-weevil, the deterioration of seed and other pests and perils to production, the possibilities of cotton culture in regions other than the South,—these and other manifold phases of the cotton question fill the public press, and attest the vital importance of the commodity to the entire country, indeed to the entire world.

In truth, it is well-nigh impossible to overstate the supreme importance of the cotton industry in the South. As a matter of fact, cotton is the staple agricultural product of ten states in the Union, embracing a population of 18,116,000 people, or about one-fourth of the entire United States. At an average price of ten cents per pound, the crop of 10,000,000 bales as estimated by the Department of Agriculture is of tremendous financial value, aggregating the immense total of \$500,000,000. The advance since last December from eight to twelve cents a pound represents an increase to the Southern planter of \$200,000,000 over any crop that he has ever raised,—about \$80,000,000 of the increase being still to accrue upon the cotton yet in the hands of the producer.

The South is the cotton store house for the world, producing three-fourths of the world's supply. For generations to come it will hold practically a monopoly of this great product.

While I hasten to express my hearty endorsement of the main contention of the distinguished gentleman who has preceded me, yet, I ask to briefly call in question the proposition advanced "that slavery was never of any advantage in developing a system of cotton production." The question is, indeed, a long one, and is perhaps of only academic interest; yet from the stand point of economic history it is of value.

Certainly if slavery may not have been an advantage, it was the actual social condition under which the cotton raising industry was planted, fostered, and developed in America. As a social organization or machine, it was a most efficient agency for getting work done. Without the negro the development of the Southern states would have been retarded half a century or longer, at least until the great tide of immigration had flowed over the Appalachian watershed, and covered the fertile reaches of the great Northwestern territory.

Yes, the winning of the South was largely the work of the negro. Unquestionably his tropical origin, and greater immunity from malignant malarial diseases peculiarly adapted him to the severe drudgery of felling the forests, draining the marshes, and subduing to cultivation the more fertile sections of the semi-tropical country in which cotton was found to thrive.

And the efficiency of the system of slavery in the growing of cotton is fully established by the statistics in the case. The decade from 1850 to 1860, for instance, shows as great a percentage of increase in production as any decade in the history of the country,—being, indeed, greater than nearly any other consecutive ten years. In 1859–60 the crop was 4,861,202 bales, an amount not again attained until 1878–79, eighteen years later, and thirteen years after the close of the war,

although the population had increased meanwhile nearly forty per cent. In fact, the increase in production of cotton since the war has not kept pace with the increase in population in the South; *e. g.*, in 1860 the cotton crop was 4,861,202 bales; in 1900-1, 10,383,422 bales, an increase of 113 per cent, the population of the cotton states being for the same dates respectively 7,513,000, and 18,116,000 or an increase of 140 per cent.

As a mere agency for producing cotton, I repeat, slavery was eminently efficient. Of course the mere production of raw cotton does not constitute an ideal economic state, and every one knows that the institution of slavery stifled the mechanical and scientific spirit of Southern society, and made impossible the highly organized, complex industrial life which in the New South is fast supplanting the idyllic agricultural life of the Old South.

As a result of this social revolution one of the most noteworthy changes in regard to the production of cotton since the Civil War is in the labor now employed. Mr. Carnegie in a recent utterance is pleased to ascribe the 11,000,000 bales of the annual crop to the labor of the negro. If the man on the ground may differ with the one so remote from the conditions under discussion, I should say that the amount of cotton made by negro labor grows gradually less every year. It is the universal opinion of those who should know, that as the generation trained in the school of slavery passes away, negro labor becomes, in the mass, less efficient. Moreover, large numbers of negro laborers are drawn annually from the fields to the large industrial enterprises developing so extensively in this section. Now the falling off in negro labor is made good, in part by a gradual increase in white labor, small farmers of the

tenant class with two or three plows, who are entering governmental lands, or subdividing the larger plantations. Statistics on the relative amounts grown by the two races are difficult to secure, but the generalizations made are based on close personal observations and wide inquiry.

As every one knows, this was impossible under the old order of things. With a system of slavery, agricultural labor, in fact, all manual labor was a badge of social inferiority. Moreover, there was a gradual acquisition of all desirable lands by the landed aristocracy,—the large wealthy planters—with the inevitable result of the rapid emigration of the middle and lower classes of the white population from the agricultural sections of the South. For example, up to 1860, according to census reports, a larger number of people had emigrated from South Carolina (a small and stationary community), than had moved into South Carolina from all the other states of the Union.

This change to white labor has been greatly facilitated by the introduction of a new factor in cotton culture that is worthy of note. I refer to the use of commercial fertilizers. As a rule, the lower classes of society had their holdings in the hill-country in the less productive soils, the "black belt" lands having been found best suited to the most profitable employment of slave labor on a large scale. But by the use of this new agency, vast regions once considered barren have been brought into profitable cultivation, and now really afford a more reliable and constant crop than the rich alluvial soils of the old slave plantations. In nearly every agricultural county in the South there is to be observed, on the one hand this section of fertile soils, once the heart of the old civilization, now largely abandoned by the

whites, held in tenantry by a dense negro population, full of dilapidation and ruin; while, on the other hand, there is the region of light, thin soils occupied by the small white freeholder, filled with schools, churches and good roads, and all the elements of a happy enlightened country life.

The yearly investment in commercial fertilizers is enormous, 628,000 tons valued at \$17.00 a ton being consumed in Georgia; 250,000 tons in Alabama; 325,000 in South Carolina; 350,000 in North Carolina; and 425,000 in Mississippi. The total amount of fertilizers produced in the United States in 1900 was, according to the census, 2,887,000 tons, all but 1,000,000 tons of which was used exclusively in the cotton producing states, being an investment of over \$30,000,000.

As a result of the demands for fertilizers, and, too, of the industrial growth of the South, an immense new profit has come to the producers of cotton in the sale of their seed. A few years ago a farmer's surplus seed were often regarded as a nuisance while to-day the by-products of the seed—the meal, oil and hulls, are a most valuable asset, amounting in 1900 to \$42,000,000, and in 1902, according to Mr. Edmonds of the *Manufacturer's Record*, to over \$100,000,000. After the oil is extracted, the seed loses nothing in value as a fertilizer, the meal being our richest nitrogenous material, while the hulls prove an excellent feed for cattle, or if used for fuel, the ash affords a most concentrated form of potash.

Time forbids but a bare allusion to the wonderful growth in the South of the manufacture of crude cotton into forms of finished products. Thirty years ago the capital invested in all the mills from the Potomac to the Rio Grande would not have aggregated \$3,000,000:

to-day it approximates \$175,000,000; spindles have increased from 667,000 to 7,500,000 and the South now manufactures one-half of all the cotton now consumed in the United States. Larger population, higher wages, increased purchasing power of operatives, a higher standard of life, better school facilities, and a general uplift in the community life are some of the attendant results.

And great as is the economic value, still greater is the sociological value of this new form of factory-village life. For this mill people is drawn not from foreign immigrants nor from distant states, but it is drawn from the poor native-born, white population. Now for the first time in their history, they are organized into community life and taking their first step toward civilization and enlightenment.

An important factor in the future development of the textile industry in the South, whose influence will be felt more and more each year, is the excellent system of textile schools being established throughout the Southern states. Artistic taste, the knowledge of underlying scientific principles, skill, and intelligence,—in a word, brains, are required for the full development of any industry.

The apprehension expressed in some quarters of a significant decline in the annual yield of cotton appears entirely baseless. The great diminution of the present crop seems entirely attributable to unfavorable seasons. No crop has ever been cultivated under more adverse circumstances. Furthermore, a study of the cotton record for the last fifty years discovers a frequent occurrence of violent fluctuations much more extreme than at present, the minimum limit being 150 pounds, the maximum, 225 pounds per acre,—the crop of 1860

being, for instance, twenty-five per cent less than that of 1859. One must believe that the combined scientific genius of America will eventually find a stay for the ravages of the boll weevil. Nor can there be any danger in the deterioration of seed arising from the cotton seed oil industry ; for no discrimination whatever is made either by the seller or the purchaser in the seed that are disposed of.

The question of most vital concern to-day in the production of cotton is the question of labor, both as to supply and as to intelligence. Negro labor is becoming restless, higher wages and things much more inviting than the mule and the plow are drawing him from the country regions. There is, in fact, a very keen rivalry for his services among the land owners. And how is his place to be supplied? Gradually, I have said, by the natural expansion of the white race, but still more rapidly, it seems, should the supply come from immigration. No where in the United States is there to-day a more inviting field for the small farmer than in the South.

And, above all, if we wish to regenerate our agriculture, and produce more cotton, more corn, more pork, we need more education, more intelligence. Few, indeed, are the farmers who are able to apply to cotton culture the beneficial results of labor saving machines, or the recent discoveries pertaining to their business. Knowledge, indeed, is power, and Mr. Sully's 25,000,000 bale crop will never arrive until there obtains in our general farming population a higher order of intelligence, mental alertness, and a more intimate knowledge of the great principles controlling the art of agriculture.

However, of one thing we may rest assured as stated in the beginning, the sceptre of King Cotton will not

pass from the South at any near date. Certain climatic conditions of temperature, moisture and distribution of gentle rain fall, combined with a favorable soil and, at present, a vast body of labor available for harvesting make the South the ideal region for the culture of cotton; and under the stimulating influence of the high prices now prevailing, the acreage for the approaching year will doubtless be greatly increased, and with favorable seasons it may not be rash to prophesy a crop of 12,000,000 bales.

THE UTILIZATION OF SOUTHERN WASTES

RICHARD H. EDMONDS

Saving labor in one direction and creating an enormous demand for labor in another, the invention of the cotton gin more than a hundred years ago caused an immeasurable waste of material and energy in the South. It hastened the passing of slavery in the North, but strengthened the institution in the South, giving the plantation the premiership and halting, though not destroying, the natural mechanical bent of the whites. It changed the course of American industrial tendencies, and diverted the flow of commerce. It made the history of the United States. It resulted in the evolution in the South of a system of agricultural labor unsurpassed in effectiveness in spite of its costliness. It supplied the raw material for industries both at home and abroad, and at the same time created a great market for manufactured articles and farm products.

But its consequent benefits were enjoyed by a minority of the Southern people. Not more than 30 per cent of the Southern white families in 1860 were owners or hirers of slaves. Their real and personal property dominated a situation giving the South more wealth per capita than the rest of the country—a situation well typed in 1850, when the per capita wealth of the whole country being \$304, that of South Carolina was \$431, the 384,984 slaves being included in the population of 668,507. Yet, at that very time, it was estimated by the governor of the state that among its white inhabitants there were not less than 50,000 persons whose employment was not sufficient to give them the honest support every white citizen felt himself entitled to. Conditions in South Caro-

lina were, perhaps, exceptional in some respects, but they fairly illustrate general Southern conditions. During the ten years before the Civil War the chance for the depressed classes to become economically valuable was somewhat bettered, especially in those portions of the South where slavery was slowly and naturally disappearing under the practical impulse that had destroyed it in the North. Then came the war with its enormous waste of human energy, life and wealth. It brought the great mass of whites to a common level of poverty. In the consequent struggle for the maintenance of race integrity they were practically debarred from production, except to meet bare necessities, and the negro race, which had never advanced except as it was guided or controlled by white intelligence, was suddenly placed in a position calling for self-reliance with its younger generation subjected to methods of training, which converted them from possible producers of thorough efficiency into thriftless dawdlers or positive parasites. The South received practically nothing of that immigration, which, after the war, gave such an enormous impulse to the development of the North and West. As a result of the war, it lost potentiality through the disorganization of an important element in its labor system.

One at first thought may not readily understand that the direct and indirect wastes of the past forty years have created the opportunity for the utilization of other wastes. Investments in Southern cotton mills, equipping them with the best machinery, need not include the money sent to the scrap pile in the shape of antiquated machinery. A mass of labor, long dormant because of a comparatively narrow field for its employment, has been given freedom at last to follow its natural inclination. Costly industrial experiments have been tried elsewhere,

but the South as a whole, with its natural resources lying fallow, has escaped them and their accompanying evils. It is in a position to profit by the experience elsewhere without any great loss of time and money, or waste of energy and material.

Seventy years ago oil was made from cottonseed in Mississippi, and, subsequently, at Mobile, Ala., Petersburg, Va., New Orleans, La., and other points, the seed was a basis of industry. Far-seeing minds of that day sketched the part that the products might play in cattle feeding, in the manufacture of soap and candles, in lubrication, painting, illumination and as a food. About that time the legislature of Mississippi passed a law to compel cotton gins to remove promptly or to destroy all cotton seed, so that the same might not become a prejudice to the health of the community. The general practice was to get rid of the seed by dumping it into running water or letting it rot, though there was an early use of it to a limited extent as a fertilizer. It was not until about 1870 that the cotton oil mill began to assume any importance in industry, and ten years later there were but 45 mills in the South with a capital of about \$3,500,000. The census of 1900 reported 369 establishments engaged solely in extracting the oil, with a capital of \$34,451,461 and a value of crude products only of \$42,411,835, only 55 per cent of the seed produced in the South being crushed.¹ It is estimated that the total annual value of the product of the 700 oil mills, not including the output of enterprises dependent in part upon oil mills, approached \$125,000,000, while

¹ An estimate made in April last placed in the Cotton Belt 702 cotton oil mills built and in course of construction, with 50 or 60 new ones chartered, the mills with their refineries and other auxiliary features representing an investment of \$225,000,000.

the value of the lint cotton in that year was \$360,000,000. The short lint secured in re-ginning the seed at the oil mill is manufactured into cotton batting. The hulls become fuel, ashes, fertilizer, fibre, paper and cattle feed. The meats become cake and meal used for fertilizer, cattle feed and crude oil. This last in various processes becomes soap stock and soap, the stock mixed with other greases appearing in the cylinders for phonographs, winter yellow oil, cottonseed stearin, a basis for butter and salad oils, including not a little of the substance imported as olive oil, summer white oil, a basis for lard and cottolene and miners' oil.

Fifty years ago objection was made to the cottonseed oil mill on the ground that it prevented the return of nutriment to the land, and consequently tended to impoverish the soil. Today the contention has been made that the most productive use of the cotton seed is in feeding it to cattle, enriching the soil with the manure and selling the cattle as beef. It is also argued that the mills paying the biggest prices for the best seed is resulting in the raising of inferior cotton. Both of these possible evils, not always inseparable from the early career of a new industry, may be overcome through the attraction to the South of the packing-house industry because of the value of cottonseed to it.

In the packing industry the blood of animals was once allowed to drain away, and the removal of such stuff as heads, feet, tankage, etc., was paid for. Now, blood, bones, horns, hoofs, hides, sinews, trimmings, etc., are transformed into tallow, soap, glue, gelatine, bristles, hair, felt, soap powders, glycerine ammonia, bone meal, poultry food, albumin, neats for oil, pepsin, knife handles, buttons, fertilizers and a host of other articles. The packer by making a chemical fertilizer of use in the cot-

ton field, by using the cotton oil stearin in the manufacture of compound lard and cooking butters, and through his need of the cottonseed meal for feeding purposes, has begun to move to the South, nearer to the cattle-raising sections of the South-west. During the past ten years at least \$20,000,000 have been invested in abattoirs and meat-packing plants in the South, exclusive of local slaughter-houses and minor packing establishments, while about \$8,000,000 of the packer's capital have been invested in the manufacture of fertilizer. This is but a small proportion of the millions engaged in the Southern fertilizer industry in which cottonseed plays such an important part.

That southward movement is but a part of the general tendency of manufacturing capital to get as close as possible to the sources of raw material, exemplified most notably, in a cotton mill built by New England manufacturers in the cotton field of Alabama, using as fuel coal from a vein which was struck in digging the foundations of the mill.

The southward movement has been hastened by the exhaustion of raw material in other parts of the country. In part, that is why the capital invested in lumbering in the South increased between 1880 and 1900 from \$23,546,076 to \$181,702,526, the latter sum being half a million dollars greater than the total capital invested in lumbering in the whole country in 1880. That is why the value of the lumbering products in the South increased in the twenty years from \$39,930,432 to \$188,114,524. It is regrettable that the South has not been free from the wasteful methods in handling its timber that have desolated vast regions elsewhere. The results of such methods appear in the apprehension that the time may not be far distant when the South's import-

ance in the naval stores trade shall have waned. In 1900 the capital invested in the turpentine industry producing resin, spirits of turpentine and rosin was \$11,847,495, employing about 42,000 persons and producing to the value of \$20,344,888. About that time Dr. Charles H. Herty, a professor at the University of Georgia, began to study the methods of the workers among the long leaf pines, and his investigations, re-inforced and expanded under the auspices of the national Bureau of Forestry, are bringing about a modification for the better in turpentinizing. He found that boxing the trees not only speeded their end, but did not secure all the possible product. He introduced a system of cups and gutters which in the first year of its trial resulted in an increase of 23 per cent in the product for a given number of trees. This increase, according to a recent statement of the bureau, has been raised to 36 per cent. In two years the number of cups in use has increased from 20,000 to 3,000,000, and the readiness of the operators to accept the new system is indicated by the fact that a pottery company that planned to supply them with the earthen cups has been unable to fill its orders as fast as they have been received and has been obliged to decline orders for more than 2,000,000 cups.

The supply of turpentine seems likely to be maintained for some years by the chemical treatment of dried pine knots, stumps, and the waste of cut-over timber lands, through what is known as the destructive distillation process. This was attempted as early as thirty odd years ago, but unsuccessfully. Interest in it has revived with the growing demand for turpentine and with the recent perfecting of apparatus. It is claimed that at one of the eleven plants using this special apparatus, ten cords of ordinary pine yielded in 36 hours distillation

960 gallons, which by separation gave 260 gallons of turpentine, 200 gallons of creosote, 100 gallons of oil of tar and 300 gallons of tar with about 100 gallons of acid waste. From ten cords of rich fat pine the average yield in the same time was 1,337 gallons of crude distillates, from which were derived 352 gallons of turpentine, 250 gallons of creosote, 150 gallons of oil of tar and 400 gallons of tar with 185 gallons of acid waste. Men who have studied this question are convinced that conducted upon a scientific and business basis, the process will yield rich results. Certain it is that pine stumps have risen in value and plants are in course of erection in different parts of the South.

Already, too, men are seriously discussing the feasibility of combining sawdust and cement, or some other binder, in the manufacture of fence posts. We have read newspapers printed in Texas upon the fabric of pine shavings, and this response to the search for material for paper points also to rice straw, while the reported lack of success from the economic standpoint in the use of bagasse, the waste of the sugar-cane, has not deterred other enterprise in that direction, for within the past few weeks, it has been announced that Boston capital will establish near New Orleans a mill to reduce bagasse to pulp to be used in the manufacture of paper board.

Coincident with these efforts to make the waste of lumbering available in industry, there has been a decided movement in the South for scientific forestry in coöperation with the Bureau of the Agricultural Department or on independent lines. In the plan for a great forest reserve in the southern Appalachians, which has a national support, an impetus has been given to the development of another natural resource of the South, its

water powers. In the early days, the water powers of the South, free all the year round, were held to be one of its chief advantages in manufacturing. Some of them were used locally, and the canal idea for the transportation of such power was developed on a modest scale. But hundreds of thousands of horse power continued to be lost for fifty years, and only recently has an adequate attempt been made to capture the rivers for direct or indirect use in manufacturing. Now, considerable progress has been made with the James at Richmond, with the Roanoke at Roanoke Rapids, with the Chattahoochee at Columbus and Atlanta, with the Savannah at Augusta, with the Tallapoosa at Tallassee Falls, including a system of transmission to Montgomery and at other points, while plans for the development of the Appomattox in Virginia, of the Catawba in North Carolina, of the Ohio at Louisville, of the Tennessee at Chattanooga, of the Black Warrior and its tributaries in Alabama, of the Yadkin in North Carolina, of the Colorado in Texas, and of other streams, are already being carried out or are being seriously considered.

Did time permit, one might give more than mention to the possibilities in the re-claimation of swamps, overflowed alluvial lands, and stretches of prairie. A thought of what has already been accomplished in rice-growing under modern methods in southwest Louisiana and southeastern Texas, and of the 30,000 square miles of the richest soil in the world in Arkansas, Mississippi and Louisiana which will be brought under cultivation by the proper improvement of the Mississippi River and its tributaries, will indicate Southern potentialities in this field.

Most of the projects for the utilization of Southern wastes are under way; others are still to be undertaken.

Preliminary to the realization of such aims must be the utilization of what is, perhaps, the greatest waste in the South, the waste of human energy through neglect or through mis-direction. As we survey the past twenty years against the somber background of the twenty years earlier forbidding aught save hope, we are justified in congratulating ourselves upon the recent material progress of the South. The advance between 1880 and 1900 in the value of farm properties from \$2,290,364,321 to \$3,951,631,632, and of farm products from \$660,131,452 to \$1,271,654,273; in the amount of capital invested in manufacturing from \$257,244,561 to \$1,153,202,368; in the value of manufactured products from \$457,454,777 to \$1,463,643,177; in railroad mileage from 20,612 to 52,594; and in the value of exports from Southern ports from \$261,214,904 to \$464,316,943, could hardly have been paralleled by any other country situated as was the South in 1880.

With but 27 per cent of the land area of the country and with its population increasing during twenty years 44 per cent, while that of the rest of the country augmented by immigration increased 55 per cent, the South's investment in agriculture increased 72 per cent, while that in the rest of the country increased 65 per cent; the South's capital in manufacturing increased 348 per cent, while in the rest of the country it increased 242 per cent; the value of the products of Southern factories increased 219 per cent against an increase of 135 per cent in the rest of the country, and to-day, while sending through its ports 35 per cent of the exports of the country, the South is producing about 40 per cent of the total exports. There is the record of accomplishment and of wonderful accomplishment if the matter of percentage of increase is alone considered.

But there is another way of looking at the subject. A hint is given in the fact that though the value of farm properties in the South increased at a greater rate than in the rest of the country, the contrary was true for the value of farm products. As a matter of fact, in certain particulars, such as the production of grain and the raising of live stock, the South is not as well off agriculturally as it was in 1860, in spite of the increase in population. In certain of the older States the per capita production of grain is less. While the actual number of neat cattle is greater, the 15,000,000 owned by the South in 1900 are a smaller proportion of the 50,000,000 in the country than were the 8,500,000 in the South of the 17,000,000 in the whole country in 1860. Moreover, their number was actually smaller in 1900 than in 1860 in half a dozen of the States, while in the forty years there was a decrease in the whole South of more than 1,000,000 in the number of sheep and of more than 950,000 in the number of swine. Again, while the South is pre-eminently, as it long has been, the producer of the cotton, the sugar-cane, the rice and the bulk of the tobacco and sweet potatoes of the country, it raised in 1899 but 28 per cent of the corn of the country as against 44 per cent in 1860, and but 12 per cent of the wheat as against 26 per cent in 1860. In spite of its unexcelled advantages of climate and soil it raised, however, in 1899 but 21 per cent of the small fruits of the country, 18 per cent of orchard fruits, 17 per cent of the hay and forage, 11 per cent of Irish potatoes, and 7 per cent of the oats. In the census year the number of persons engaged in agriculture in the South was 5,127,035, and they produced \$248 per capita. In the rest of the country the 5,254,730 persons engaged in agriculture produced \$655 per capita. The showing in manufact-

uring is somewhat better for the South than in agriculture, notwithstanding the fact that the South has so long been regarded as a distinctively agricultural section. For, while the 4,529,120 wage earners in industry in the rest of the country were occupied in production to the value of \$11,546,393,337, or \$2,549 per capita, the 785,419 Southern wage earners were concerned in production to the value of \$1,463,643,177, or \$1,863 per capita.

In making these comparisons it must be remembered, of course, that persons engaged in agriculture include the employing class as well as the employed, while in manufacturing, only those employed at wages are included. In agriculture the class corresponding to the wage earners in manufacturing represents but about 42 per cent of all engaged in agriculture, while the wage earners represent about 90 per cent of all engaged in manufacturing. It should be noted, too, that much of the manufactured production of the South is the result of what may be called the primary movements in industry, such as lumber, cotton yarn, pig iron and crude petroleum, representing, perhaps, a greater weight, but a smaller price than the results of second and third and fourth handling of this material in other parts of the country. A thought of the difference between the value of a pig of iron at Birmingham, Ala., and its value at Waltham, Mass., after it has been converted into steel watch springs, will convey an idea of the difference, broadly speaking, between manufacturing in the South and in the rest of the country. But even in this respect a change is underway in the South. Fine cotton goods are made there, as well as yarn, and the tendency is very rapidly toward diversification and the making of finer goods. High Point, N. C., is a vigorous

rival in furniture-making of Grand Rapids, Mich. Around the furnaces of northern Alabama have grown pipe works, car works, steel, wire and rail mills. On the Texas coast where oil was discovered only three years ago, millions of barrels are being refined for shipment coastwise and to foreign ports.

Still, all that should be done is not done, either in agriculture or in manufacturing. That is not because the South is not fully at work. The increase in the assessed value of property there between 1880 and 1900 from \$3,051,175,098 to \$5,457,553,031 and between 1900 and 1902 to \$5,916,960,712, or at the rate of nearly \$230,000,000 a year, is a fair indication of energy, even allowing for changes in assessment schedules. There is another even more significant fact. There are more persons in proportion to the population engaged in gainful occupations in the South than in the rest of the country. But the females constituting 16 per cent of the persons engaged in agriculture in the South, including, of course, the large number of female negroes in the fields, are a mark of the comparative backwardness of farming there not to be overcome by natural advantages. Women constituting 25 per cent of the persons in mechanical pursuits in the rest of the country, mark of the highest development of the age of machinery with its effectiveness in production. The contrast is the broad distinction between industrial conditions in the South and in the rest of the country.

It is the immediate explanation of the fact, modified though it may be by the enormous contributions of Southern agriculture and manufacturing to the commerce and the industry of the rest of the country, that

the South is not making as much of its opportunities for wealth production as is the rest of the country.

The opportunities are here, but neither are there a sufficient number of persons to develop them, nor are the number available sufficiently qualified to develop them completely. The lumber camp, the oil mill, the mine, the furnace, and railroad construction attract the negro males from the plantation and the farm. Wherever the heavy work of Southern industry is under way, there will be observed a tendency of negro males to outnumber the females. The cotton mills in the older states attract the whites from the small cotton farms, the movement being checked now and then by high prices for the staple. Thus there is a halting of growth in one direction with an undue acceleration in another. In some respects the South may be regarded as burning its garments to keep itself warm, and that too, under the most strenuous economic compulsion.

For the primary remedy the South needs inhabitants. In its 807,045 square miles there are but 23,548,401 persons, or 29.1 to the square mile. What this average really means appears from the fact that the density of Ohio is 102, of Indiana 70, and of Illinois 86. The South must let it be known that it has abundant offerings for the farmer and equally abundant places for the worker in other industries. With all its progress it is still very, very far behind such a section as New England, with 90 persons to the square mile, largely dependent directly or indirectly upon products of the South for the means to exercise their talents as wealth producers.

With increased population and better means of communication and greater wealth flowing from that in-

crease, the South will be in a better position to provide the means for the proper education of its workers, and in the elaboration of the plans already mapped in the broadest sort of way will, in wisdom born of experience, evolve a readjustment of its labor system, permitting the individual to advance with the least waste of energy and of time upon lines most productive for the community.

THE RELATIONS BETWEEN RENT AND INTEREST¹

FRANK A. FETTER

PART I. NEGATIVE CRITICISM OF THE CONVENTIONAL RENT AND INTEREST CONCEPTS

1. Logical clearness and practical needs call for a re-examination and restatement of the economic concepts of rent and interest.

This proposition expresses the thought of many contemporary economic students. The thought is reflected in the recent remarkable revival of interest in this phase

¹ The argument in this paper, forced into excessive brevity at many points, should be interpreted in connection with other essays by the writer, published from time to time in the past three years. Arranged, as nearly as their special nature permits, in a logical series, they are as follows:

1. The next decade of economic theory, *Publ. of Amer. Econ. Asso.*, 3d ser., vol. 2, no. 1, p. 236-246, (read Dec. 29, 1900). Points out the relative and temporary nature of the old concepts of rent and of capital, and suggests the general direction that may be taken in their restatement.

2. The passing of the old rent concept, *Quar. Jour. Econ.*, vol. 15, pp. 416-455, (May, 1901). A detailed criticism, purely negative, of Marshall's doctrine of quasi-rent, as typical of the prevailing unsettled condition of thought on this subject.

3. Recent discussion of the capital concept, *Quar. Jour. Econ.*, vol. 15, pp. 1-45, (Nov., 1900). A review of the contributions of Clark, Irving Fisher and Böhm-Bawerk to this subject, criticising especially the last named in his distinction between social and individual capital, between consumption and production goods, between natural and produced agents; concluding with a positive statement of a concept of capital, as distinguished from wealth.

4. The "roundabout process" in the interest theory, *Quar. Jour. Econ.*, vol. 17, pp. 163-180, (Nov. 1902). A criticism of Böhm-Bawerk's "Positive theory," showing that his retention of a defective capital concept is the cause of his retaining (inconsistently) a productivity theory of interest; concluding with a suggestion of the true relation of productivity to a theory of interest. The present paper unites, and develops somewhat, the various arguments in this series of articles.

of economic theory. The truth of the proposition is, however, not recognized by all. Some look upon the Ricardian doctrine of rent as an eternal verity, and deem the agitators of new economic concepts to be the pernicious disturbers of theoretical calm. Some economists cling to the traditional views as some theologians cling to out-grown creeds, oppressed with the thought that if the ancient faith gives way nothing can take its place. With rock-ribbed conservatism argument is vain, but such an attitude has one considerable justification: the recent rent controversy has been almost entirely of a negative character. The period of destructive criticism has elapsed; but erroneous concepts will not be discarded until positive and practically applicable ones are put in their places.

2. The generally accepted definitions of rent and of interest are imperfect in that they mark only a small portion of the boundaries of the concepts actually employed.

Criticism of definitions should not be unreasonably exacting. It is sufficient that the definition state the essential characteristic of the concept, for it is impossible to include in a sentence all the logical and practical developments of the central thought. It is no vital fault that the statements that rent is income from natural agents, and that interest is the income from products used in production, do not tell everything about rent and interest. But the prevailing belief is that all of the essential contrasts of rent and interest so much dwelt upon for a century past, result from the one defined and simple difference as to the kind of goods yielding the income. In fact, however, the concepts of rent and interest are not developed along parallel lines, other most fundamental terms being unconsciously introduced into them. The prevailing concepts of rent and interest, therefore, have an exceedingly complex character, and what is

worse for clear thinking, this complexity is concealed beneath a simple form.

The two propositions above state the negative portion of the thesis to be here maintained. Part I of this paper, given to negative criticism, is continued in propositions 3 a, b, 4, 5 a, b, c, and summarized in 6, these together forming a demonstration that the conventional rent concept contains several conflicting thoughts. Part II, consisting of propositions 7 a, b, and 8 is an examination of two possible but inexpedient ways of making the rent and interest concepts formally consistent, by developing propositions 3 and 4. Part III, the positive solution, points out in propositions 9 a, b, c, the logical and practical line of distinction to be found in propositions 5 a, b, c, when they are consistently developed, and concludes in 10 and 11 with the outline of a new theory of distribution.

3a. Since the beginning of modern economic theory, rent and interest have been defined by social marks; rent has been said to be the income of land owners, interest that of merchants, manufacturers and city men of wealth.

This distinction deserves mention, when the most recent and one of the keenest critics in this field expresses himself as follows: "It is a commonplace of historical economics that land was first given the rank of a factor in production coördinate with labor and capital for the simple reason that in England, the home of classical political economy, the landlords formed a social class distinct from the capitalists and laborers."¹ Adolph

¹A. S. Johnson, *Rent in modern economic theory*, p. 19, Publ. Amer. Econ. Asso., 3d ser., vol. 3, no. 4. Probably most students would not consider this explanation a commonplace and would even deny that it truly states the principal cause of the distinction in question. The author quoted makes it the main thesis of his book that the difference between land rent and interest, though thus originally observed as a merely transitory historical fact, remains of permanent significance.

Held, probably the first to suggest this origin, states quite dogmatically, without discussion, that "the social classification appeared so sharply in England that Adam Smith accepted it without question, and accordingly distinguished the kinds of incomes without inquiring how far property in land and capital belong together."¹ However it originated, this thought of rent as a personal income of the members of a social class, persists to-day, as may be seen in many representative definitions.² The conscious distinguishing of the conceptions of economic and contract incomes is a recent phase of thought, as yet but slightly reflected in the formal definitions. Ownership, though frequently thus included in the definition, has not played an essential part in economic discussion because, as used, the definition became a mere truism. Goods and incomes were not classified according as they belonged to members of different social classes, but, on the contrary, social classes were distinguished according as they were receiving incomes from particular kinds of goods. The income of the landlord as a person was made up of the yield from such varied agents that to the personal mark (membership in the land-holding class), necessarily was added at once an impersonal mark (the kinds of agents yielding the income.) A man was considered to be a landlord if his most important income came from land. As the thought of rent as landlord's income and as income from land never have been very sharply distinguished, we may designate this second phase of the thought as 3b.

3b. Rent, in the conventional treatment, was there-

¹ *Zwei Bücher zur socialen Geschichte England's*, p. 160.

² Note for example, Ricardo, 1817: "that portion of the produce of the earth, which is paid to the landlord", etc.; F. A. Walker, 1887: "the remuneration received by the landowning class", etc.; Marshall, 1890: "the income derived from the ownership of land," etc.; Bullock, 1897: "the return that is secured by the owner", etc.

fore said to be the income derived from natural agents, and interest that from produced, or artificial agents.

When this is made, as it was, the central thought of rent, that part of the income of landlords that is derived from improvements is excluded and is declared to be interest. A minor fallacy then appears in that rent is either landlord's income or income from land, as is most convenient to the immediate purpose of the writer. The principal thought in rent remains, however, that of income from the use of natural agents. The grave difficulties in the application of this thought will be later criticised (In 7b). Other ideas now to be noted were, however, from the first, associated with the original thought.

4. The characterization of rent as that income from material agents which does not enter into cost of production, and of interest as the income which *does* so enter, was a shifting of the central thought of the concept; what was, at first, thought to be a merely incidental peculiarity of land rent, became its essential feature, and then the center of a more general concept of rent.

If this idea did not originate with Malthus and Ricardo, it was emphasized strongly in their criticisms of Smith as the main peculiarity of land rent. The supposed peculiarity of the relation of land rent to price rested on fallacious reasoning, due to the unconscious introduction of new conditions into the concept.¹ The gradual displacement of the earlier conception of rent as income from land, by the no-cost-of-production concept, is one of the interesting chapters in the history of economic theory. First, the no-cost camel thrust only its nose into the tent, then it crowded out entirely the former occupant. To-day the no-cost concept is in large degree dominant, although the old definitions, the

¹ This question is dealt with more fully in "The passing of the old rent concept", especially pp. 432-452.

old arguments, and many inconsistent conclusions of the older treatment remain. Marshall's treatment of rent and quasi-rents shows the orthodox order of distributive theory dissolved into chaos by illogically conserving the older thought while developing a newer one. The quasi-rent doctrine, however, takes a long step in the right direction, for it recognizes the likeness of the yield of land and of other concrete goods.

What is most pertinent to the present purpose is that this thought of rent, as usually developed, is in its nature a compromise. The old idea and the new are entertained, together. The same old formal definition is retained; the newer distinction, brought in to modify and explain, only complicates and confuses the rent concept. Certainly none of the contemporary supporters of this view have as yet framed a definition that is more than temporizing. But even if a choice were made between these two essentially different concepts of rent (and of interest) ambiguity would not be banished, for in all the older discussion of rent and interest another distinction has been assumed whose significance usually has been quite unsuspected, but which in fact contains the key to the problem.

5a. An essentially different distinction between rent and interest is tacitly introduced into the discussion when the amount of the bearer, or source, of rent is expressed in physical terms as to quantity and quality, while the bearer, or source, of interest is expressed in the general value unit as a principal sum.

That this distinction is made a part of the conventional concepts will be recognized by all students of economic theory. Equally evident is it when once attention is called to the fact, that this is done without recognizing the changed point of view thus taken toward the two kinds of goods. The Columbus of economic

theory who stood this egg on end is Professor John B. Clark. All the standard texts declare, in discussing interest, that capital consists of concrete goods, and is neither mere money nor mere abstraction, yet at the same time they speak of capital as of uniform quality and as yielding a uniform rate of income. This is said to contrast capital strikingly with land, which is measured by the acre, and differs from unit to unit. Professor Clark, in his brilliant criticism of this confused thought, has vividly pictured the varying grades of "capital goods" as he calls them, and has shown that artificial agents can be viewed in concrete form and expressed in physical terms in the same way as natural agents usually are. Most students, therefore, are ready to recognize the truth of a statement that would have been startling some years ago: the contrasts supposed to reside in the objective differences between natural agents and capital are but subjective differences due to the points of view taken by the thinker when he chooses to express the quantity of goods in different modes.

These differing modes of expressing the bearers of the two incomes involve corresponding differences in the conceptions of their maintenance and of their income. As these conceptions are but phenomenal forms of the thought expressed in § a, the statement of them will be numbered § b and § c.

§b. In estimating its net income, the bearer of rent is thought of as materially unimpaired by use, being preserved in identical form or in kind; the bearer of interest is thought of as maintained of undiminished value, expressed in terms of some conventional standard.

This is a contrast in point of view that is entirely unrelated with the contrast presented in the formal definition, and confusion results. The taking of different points of view is allowable; indeed, it is necessary if all aspects of any subject are to be considered. The inconsistency is

in unconsciously shifting the point of view and believing that the differing natures of the objects were the cause of the differences observed. Two similar houses viewed, the one from the front and the other from the rear, appear to be very differently planned. The one blind man who got his idea of the elephant by touching the tusk is said to have argued long with the other who had caught hold of the animal's tail. Debates as hopeless as this, result from the shifting of the concepts here under discussion.

A side light on the theoretical analysis above may be given by a brief suggestion of the historical conditions in which the distinction took its rise. The rent contract, almost universally employed in the Middle Ages in transferring the temporary control of wealth, involves a legal fiction. Land, houses, cattle, whose use is delegated to the tenant, must, according to the terms of the contract usual in such cases, be returned in the same condition as when borrowed. The performance of this contract is literally and physically impossible; but by means of agreements as to repairs and replacements, the agents can be restored in equally good condition. Every rent contract for the use of agricultural land is in its terms a disproof of the idea that rent is paid alone for the original and indestructible qualities of the soil; yet the fiction of a perpetual rent-bearer deceived Ricardo and has continued to deceive. The interest contract came into use much later, as a money economy arose; hence, its employment was confined, until the last century, almost entirely to money loans and to the transfer of city wealth. This chance historical parallelism between land, rent, country and landlord on the one hand, and machines, interest, city and merchant on the other, explains many of the fallacies that beset economic thought in the first conscious attempts to analyze value.¹ The rent con-

¹ This thought was stated with a somewhat different emphasis in "The next decade of economic theory," pp. 243-244.

tract and the interest contract are not in any essential way connected with land and produced agents respectively, and the chance use of them for transferring certain kinds of goods has within the last century become less and less common. The contrasting form of contract in rent and interest (and a corresponding contrast in the mode of estimating the income bearer in economic rent and interest) was introduced into the older concepts alongside of the formally recognized characters, making the concepts complex and contradictory.

5c. Contract rent (corresponding with the thoughts in 5a and 5b) is treated by all writers as an absolute amount, not as a percentage of the income bearer; contract interest is treated as a percentage of a principal sum. A similar distinction is made in the case of economic rent and economic interest at certain moments.

The conception of economic income being more subtle than that of contractual income, is less easily grasped. Contractual income is personal, economic income is impersonal. While it was contractual rent that drew the attention of the earlier economic students, it is economic rent (using the term in a broader sense than mere land rent) that constitutes the real problem in economic theory.

Here also a word of economic history throws light on the origin and occasion of this distinction as applied to the contractual incomes. The theorists of 125 years ago found contract rent in extensive practical use. While mainly used in reference to the income of land, the word rent was taken in a much more general sense both in English and in the continental languages. Houses and machines were then rented as pianos and automobiles are now. At first the income from land was specifically distinguished as "land rent," but Ricardo's authority specialized the term "rent" in English economic theory, and,

ever since, economists have struggled in vain to establish their word usage in the place of that sanctioned by many centuries. A part of every conventional discussion of rent is given to explaining that "in the economic sense" it means only the income from land considered apart from improvements.

The renting contract doubtless was the exclusive mode by which the temporary use of wealth was given and acquired in primitive communities. It certainly continued throughout the feudal period to be all but universal in the rural economies. The interest contract was an impossibility until the rise of a money economy. Money came into use first in the cities, and there also was felt most strongly the inconvenience of the renting contract. The ventures of the merchant at home and abroad required goods so various in quantity and quality, so difficult to measure exactly except in terms of value, that the borrowing of them was hardly possible except in the form first of general purchasing power, that is, under the interest contract. And it is so to-day. The differing practice was due to business convenience, not to an essential difference in the economic nature of the goods, and while in fact machines can be and are "rented," land and other natural agents are often temporarily acquired nowadays under the interest contract. As contractual incomes both rent and interest are found alternating in practice, and just because the contracts are so different in outer form, the incomes appear to have in many ways essentially different characters.

6. There are thus included in the generally accepted concepts of rent, without formal recognition, three essentially different and often conflicting thoughts:

(a) It is the income of a special social class, marked by the ownership of a special class of physical agents (the characteristics being somewhat shifting).

(b) It is any income having a special relation to price, namely, that "it does not enter into the cost of production".

(c) It is an income that is yielded by wealth measured physically and that is expressed as an absolute sum.

In each case rent is in contrast with interest which is (a) received by a different social class, and from a different class of agents, or (b) has a supposedly different relation to the value of products, or (c) is estimated as a percentage of a principal sum or value of wealth.¹

If the incomes from wealth are to be grouped logically and classified practically as rent and interest, the three foregoing tests must be applied to each income as it appears. It is assumed in the conventional treatment that these tests give consistent results. Unless, however, the three tests are logically related, it is incredible that the results of their application should coincide in more than a small number of cases. Indeed, every contradiction that is possible by combining these independent tests occurs at one time or another in the conventional treatment of rent. The entire collapse of the old rent doctrine has been prevented only by failure to apply the tests to all cases and in full measure. The thought is shifted as convenience suggests. Starting with the formal definition framed about the first thought, the treatment shifts to the second or third. Such a method cannot be defended as a legitimate employment of a continuity concept. Continuity does not justify the cross-logic of a three-fold or four-fold principle of classification. There is no continuity in the jump from natural agents to consumer's rent, or from landlord's income to the contract to restore in kind.

¹ Still other distinctions find partial recognition in current economics. See "The passing of the old rent concept", 423-431, for a discussion of space extension and of time in this connection.

In concluding the merely negative part of this paper it should be reiterated that propositions 3, 4 and 5, summarized in 6, are to be interpreted collectively. In the foregoing argument it has not been maintained that any one of the three principal thoughts contained in these three propositions cannot be made formally logical if it is developed by itself consistently. It is, however, maintained here that when these several thoughts are employed together without a recognition of the resulting complexity, fallacious contrasts and conclusions result. Differences between rent and interest, that are assumed to arise out of the nature of the two classes of agents, are but the reflection of the changing subjective attitudes of the theorists.

In Part II is to be considered the logical character of the concepts resulting from a consistent development of each of the first two thoughts here recognized.

PART II. EXCLUSION OF TWO POSSIBLE FORMAL SOLUTIONS OF THE INCONSISTENCIES

7a. Formal consistency might be gained if the distinction between rent and interest were made to turn on the difference in the social classes that receive the incomes; but this is almost purposeless in economic theory.

A merely formal concept of rent might be framed about the thought of a social class. Rent might be defined as the income of wealthy men or of those moving in the best society. English conditions naturally suggested to the thinkers of a century ago the contrast of agricultural land holders and city men of wealth. But it is safe to say that no such social classification ever has been or ever could be presented that is either exact or significant enough to serve in the analysis of value. The economic theory of value is essentially an attempt to explain impersonally the origin and degree of importance of

goods. The social class concept of rent thus involves a distinction not primarily economic, and one that is incapable of even a moderate degree of exactness in practical application. When, moreover, membership in a social class is tested by ownership of a particular kind of agent, the social aspect of the concept almost disappears. The connection of the thought of land rent and landlords as a class could continue only in the peculiar social conditions of England, and then it corresponded only in a broad, not in an exact way, with realities.

7b. Formal consistency is possible if the distinction between rent and interest be made to turn *solely* on the difference in the classes of physical agents that yield them; but this distinction is quite incapable of practical application.

The only classification of wealth that ever has been suggested for this purpose is that into natural and artificial, or unproduced and produced agents, or land and "capital." Such a classification may be required to meet two tests. It is expedient only if the two classes of agents can be practically distinguished by marks or evidences that can be taken account of in the practical world; it is logical only if it is consistently applied.

Land in an unimproved state is rare if not unknown in modern societies. As nearly every concrete thing is a bit of natural material adapted artificially to some degree to man's use, everything according to this conception should have in it elements of capital and interest, and elements of land and rent. No practicable method of deciding whether a thing is land or capital ever has been suggested, much less applied.¹ When one considers the nature of the case, it appears impossible even to conceive of such a test.

¹ The ablest attempt to face this difficulty formally, that of Böhm-Bawerk, in his "Positive theory," pp. 55-56, is quite unsuccessful. A criticism of his argument is given in "Recent discussion of the capital concept," pp. 30-39.

Therefore economic theory, unable to make the division between land and capital along a concrete and objective line, has been led to make it along an abstract line. Rent was said to be the income from land "considered as unimproved," or "considered apart from improvements;" while interest was that part of the income of land that was to be considered as due to improvements or to produced agents. Ricardo put it that rent is paid to the landlord for the use "of the original and indestructible qualities of the soil." Few writers that have accepted the Ricardian definition, have failed to apologize for the evident error in the phrase. Ricardo apparently meant, not that all qualities were indestructible, but that they might be spoken of as undestroyed, if annually repaired. Indeed it would be difficult to find a writer that does not, both in theoretical and practical problems, give up the impossible task of distinguishing all the value due to improvements on land. It is so much easier to wave the difficulty aside by "incorporating" or "merging" the improvements into the land. It has not been recognized that the original thought has thus been departed from, that the practical difficulty has been slurred over, and that a metaphysical division has been substituted for a concrete classification. The designating of an improved field as land or natural agents, and of an improved piece of iron as capital, becomes a purely arbitrary matter. The test is not found in immobility. Are the Suez Canal, the Hoosac Tunnel, the ploughed field, land or capital? A touch of human labor is at one time believed to convert the entire material into capital, a larger amount of labor at another time is declared merely to incorporate itself with the land and become indistinguishable from it.¹ The notion

¹ This idea as held by Böhm-Bawerk is more fully criticised in "Recent discussion of the capital concept", p. 37.

that it is a simple matter to distinguish between the yield of natural agents and that of improvements is fanciful and confusing, is responsible for many errors, including the cruder part of the single tax doctrine. The distinction doubtless more nearly approaches business realities in the case of city building sites than in that of agricultural land. It must, however, be maintained that the objective classification of land and capital as natural and artificial agents is a task that always must transcend human power of discrimination.

The vagueness of the line between natural agents and capital is increased by the fact that money and artificial agents measured as "capital" can be and are so often invested in land. Where land becomes a commonly marketed form of wealth, the classification of rent and interest according to the social class of owners becomes meaningless, and the classification accorded to kind of agents grows quite out of harmony with business usage. An attempt to meet the difficulty is seen in the more recent contrast between capital from the individual and capital from the social point of view, which is an abandonment of the distinction according to the class of agents in most of its possible applications. This complicates instead of solving the difficulty, which must be logically met.¹

§ 8. Formal consistency may be gained if the distinction between rent and interest is made to turn on their supposed relation to cost of production.

It is always a scientific service to carry to its extreme possibilities any abstract distinction, for thus only can be made apparent its merits and defects. In the gradual enlargement of the no-cost-of-production notion of land rent (noted in proposition 4) until it becomes the essen-

¹ The "land concept of rent" in the somewhat complex form as held by Marshall, is criticised in "The passing of the old rent concept", pp. 418-423.

tial thought in the rent concept, the view of Mr. John A. Hobson represents nearly this ultimate development.¹ Moved by the desire to find a basis in the theory of rent for a juster system of distribution and of taxation, he re-examines the problem and arrives at the conclusion that "the law of rent, in its extreme application, is valid for each factor." A fund is required as well to keep land and labor, as to keep capital in repair, above which sum, he thinks, the differential expenses of production "whether they be rent, interest, or wages, will not enter into the market price of the supply." While he thus narrows the conception of rent in some ways, he widens it greatly in others. He retains, though after modification, the notion of a no-cost-factor, and broadens it greatly. He stops just short of rejecting the whole distinction between land and capital as unproduced and produced agents. As a result of this and other recent criticisms, a doctrine of general rent, or of quasi-rent, is the dominant idea regarding rent to-day in many minds.² As a negative criticism Hobson's essay has the highest merits, demonstrating, as it does, how illusive are many of the supposed peculiarities of the various incomes in the older treatment of distribution. His idea of cost and "no-cost" factors is moreover closely in touch with realities, for cost in his discussion is a very concrete thing, representing the repair and replacement fund needed for each factor. Moreover, there is for the theory of social legislation much suggestiveness in the idea of the surplus feature in each income that is above "cost," and therefore amenable to taxation. For all this,

¹ "The law of the three rents," article in *Quarterly Journal Economics*, vol. 5, p. 263; restated in his "Economics of distribution," 1900. Likewise in vol. 5, p. 289, appeared John B. Clark's remarkable paper on "Distribution as determined by a law of rent."

² The change in the rent concept is reviewed in "The next decade of economic theory", pp. 241-242.

Hobson's treatment does not yield a satisfactory solution of the problem of the rent concept, notably because rent is left quite unadjusted, and unrelated to, the interest concept. Though Hobson, in concluding, expresses the hope that he has laid the basis for a "sound theory of distribution," he recognizes the complexity of his concept and the difficulty of its application.¹

The distributive system presented by Dr. C. W. Macfarlane² is, however, a further step into abstraction. That writer, believing that any given factor may, at a given moment, have various relations to price, reaches the somewhat bewildering conclusion that land (which "includes all natural forces except labor") and entrepreneur's service, each may yield both rent and profit; capital may yield rent, profit and interest; and labor may yield rent, profit and gain. Whether and how far any income is thus to be named depends on whether it is "price-determined" or "price-determining", a transcendental inquiry as difficult to apply as the small boy's method of catching birds by salting their tails. As the conception that some incomes bear a peculiar relation to price grows out of fallacious reasoning, no logically sound classification of incomes can be based upon it.³ But if it were sound, it still would be the extreme of abstraction, confined to the most subtle and probably useless economic speculation. Even if such a no-cost-of-production concept of rent could be made formally logical it still would lack expediency for a theory of distribution.

¹ "The law of the three rents," pp. 287-8.

² *Value and distribution*, 1899.

³ The mistaken origin of the no-cost concept is shown in "The passing of the old rent concept", especially pp. 446-452.

PART III. POSITIVE SOLUTION OF THE THEORETICAL
PROBLEM OF RENT AND INTEREST

9a. Consistency must be gained by substituting for the older futile distinctions, that between the wealth aspect and the capital aspect of material goods.

Neither the physical classification of agents, nor the metaphysical classification of abstract types of income, affords an answer to the theoretical and practical problem of rent and interest ; but in the consistent development of the third important thought contained in the old and confused rent concept, the desired solution is found.¹ Rent and interest, until recently, have been looked upon as corresponding respectively to two different factors of production. In recent criticism the idea of correspondence or parallelism between each factor and its income has been abandoned, but the two material factors (natural and artificial) are still retained. A better positive theory must clear up the confusion as to the differing nature of these factors. Present in the thought of the older economists, along with the distinction between natural and artificial agents, and coloring their conclusions, has been the distinction here suggested. Durable goods were sometimes thought of as yielding uses (the wealth aspect), but land was the only important class of agents that was regularly so viewed. Durable goods were sometimes thought of as saleable at their present worth (the capital aspect), but only produced agents, the materials and instruments of manufacture, were usually so viewed. Both classes of agents can be looked at consistently from either point of view, can be considered either as bearer of rent, or as discounted sum of rents, either as wealth or as capital. It is in the confusion of these contrasts that most of the old opposition between income from land and income from

¹ This solution was implied in the capital concept presented in "Recent discussion of the capital concept", pp. 40-45.

artificially produced agents was found. This fog is lifted when the sources of rent and of interest cease to be considered as physically distinct and objectively differing kinds of goods, and are seen to be simply the same body of income yielders, differently viewed, calculated and expressed for theoretical and practical purposes.

9b. Corresponding with the distinction between the wealth aspect and the capital aspect of material goods, are the differing thoughts as to the maintenance of the factors.

In the earlier industrial stages when exchange is rare and money but little known, it is inevitable that the uses, or rents, of durable agents should be primarily thought of. In estimating the uses, allowance must first be made for keeping the agents in physical repair. This calculation is necessary not only in making the rent contract, but in conducting the individual economy, if net income is to recur. As was shown above, the supposed durability of land and of its qualities for which rent is paid, is largely an illusion due to ignoring its constant repair. The preserving of the rent-bearer in identical form or in kind is essential to the concept of a perpetual rent.

As the money economy displaces the barter economy, and the thought moves from the valuable present rent to the present saleable value of the rent-bearer, the capital sum of value is thought of as kept intact before a net income from it is estimated. This is a primary condition of the contractual money loan, requiring the repayment of a principal sum apart from interest, and this becomes the leading type of modern business calculations.

The blunder of the older economics in connecting land and rent with the one mode of calculation, and artificial agents with the other mode, has been noted above in proposition 5. Not only is it possible to view both aspects of use-bearers consistently, but clear theory and sound business practice require that this be done.

9c. As a necessary result of the distinction between the wealth and the capital aspects of agents, and of the thoughts as to the maintenance of the factors, rent must be expressed as an absolute amount, and interest as a percentage of a principal sum.

This is stated mainly for formal completeness, but it emphasizes the retention of a feature of the older treatment whose significance was unsuspected. In fact the expression of interest as a percentage marks interest as the form of income most connected with mobile and saleable agents, it makes of interest a "marginal" factor in price, a fact so much emphasized in the older treatment, it connects interest peculiarly with the element of time, as so many writers have felt it should be. Yet the percentual form of expressing interest is impossible when the income bearer is measured by physical norms, it is practically inevitable when the income bearer is expressed as a capital sum.

10. The rent and interest concepts, when looked upon as successive steps in the analysis of value, instead of as coördinate shares dividing between them the income from material agents, are made consistent internally, mutually, and with the foregoing conceptions of wealth and of capital.¹

It was suggested in proposition 5 that the treatment of land rent as an absolute amount, and of interest on produced goods as a percentage of their value, grew out of prevailing practice in the contracts for the use of wealth. Either mode of expressing income may be logical if consistently employed, and if divorced from the confusing prejudice that the difference is due to the different nature of the factors yielding the two incomes. This error recognized, economic theory must abandon

¹This conception was briefly suggested in concluding the criticism of Böhm-Bawerk: "The 'roundabout process' in the interest theory", pp. 177-180.

the old distinction as to the differing factors. What is left in place of the old rent concept? All that was best in it, freed of error: rent is the usufruct attributable to any material agent. The uses of material agents considered apart from the using up of the agents, are in this view always and only rents. This is a logical thought, a useful one and one applicable to practical problems.

When to rent has thus been assigned all current incomes from material agents there is no place for the old concept of interest as the yield of produced agents. But rents accrue at different points of time and vary in value accordingly. Present uses and future uses differ. A more or less durable agent represents a series of rents. The capital value of a good is the sum of its prospective rents and uses, discounted at a rate that reflects the prevailing premium on the present. Capitalization, thus viewed, is logically a later stage of the problem of value than is rent; and interest first appears in connection with capitalization. As the market expression of the all-pervasive premium of present over future, interest may appear in connection with any gratifications, whether they be yielded by natural or by produced, by material or by human, by durable or by perishable agents. There is not a writer from Ricardo to the present time by whom this universal application of interest is not vaguely recognized; there probably is not one by whom its application is not more or less inconsistently restricted.¹

11. The propositions above imply the need of a radical restatement of the theory of distribution, and suggest its essential outlines.

The prevailing theory of distribution rests upon the idea of three (more often lately, four) objectively differing factors, to which correspond three (or four) different kinds

¹The broader conception of interest was presented in "Recent discussion of the capital concept," pp. 21-30, especially pp. 27-28.

of income. Some later, more subtle, attempts to restate the theory have left it far from realities and quite unusable. Another solution may be found by combining into a logical system the three typical modes in which goods appeal to wants. First, goods appeal directly, as want-gratifiers immediately available. Here is required a theory of wants and enjoyable goods, and the technical analysis of marginal utility. The mental process here examined is chronologically the first stage of evaluation in the history both of the individual and of the race. Secondly, goods appear as more or less durable, and may be made comparable by being considered, through repairs, to be lasting use-bearers, yielding in a given short period a group of uses. Here is the place for the theory of rents. This is chronologically the second stage of evaluation, when durable goods are thought of and expressed in terms of their usufructs. Thirdly, whenever two non-synchronous gratifications, rents or series of rents, are exchanged, they must be discounted to their present worth to be made comparable. Here is required a theory of capitalization, that is of economic interest. This is historically as well as logically the latest stage of evaluation, characteristic of a developed money economy and of a "capitalistic" era. These three phases must be observed in every complete analysis of value. They are in some respects analogous to the three dimensions in geometry. The older economic theories were curiously crude caricatures of such an analysis. The cost-of-production theory of the exchange value of commodities, (assumed to be the whole theory of value) roughly corresponded only with the first. The old theory of land rent caught a fragmentary view of the second. The old theory of interest on a narrowly conceived class of "capital," was an ineffective attempt to express the third. The theory of value in the present conception

proceeds from the simple to the complex, from the immediate to the distant gratification, from the goods directly in contact with the senses, to those whose utility is indirect and only in expectation. While the negative criticism of the past three decades has wrecked the old distributive theory, many admirable positive contributions, widely diverse in character, converge to the solution here presented.

THE RELATIONS BETWEEN RENT AND INTEREST—DISCUSSION

THOMAS N. CARVER : I do not find so many stages in the development of the rent concept as the paper before us attempts to trace. It seems to me, on the other hand, that the development of that concept has been comparatively simple and logical. But in trying to trace this development, we should first distinguish sharply between the technical concept and the popular concept, each of which has had a development of its own.

The technical or scientific concept started with the idea of rent as the income derived from the ownership of land. Then it was discovered that this income had certain characteristics, aside from the question of its source, which made it unlike other incomes, the most important of these characteristics being that the rent of a given piece of land was the difference between the price of the product and the cost of producing it on that particular piece of land. Rent was, hence, a kind of surplus, or unearned income, in the sense that it came to the landlord without his having done anything to produce it. Then the concept of rent was broadened in one direction, so as to include any other form or surplus, or unearned income, and narrowed in another so as to exclude that part of the income from land which might be said to be earned by the person receiving it, namely, the income from improvements. In other words, rent came to be regarded as a surplus income, rather than the income from land, though the income derived from the ownership of land was still regarded as the most important form of surplus income. It is this change in the concept which alone makes such terms as producer's

rent, quasi rent, consumer's rent, composite rent, etc., intelligible. This, I believe, is the only essential change which the technical rent concept has undergone, and I believe, moreover, that the change was a logical one, and that this later form of the concept can be successfully defended, though there may be good reasons for giving it some other name than rent.

The idea that rent does not enter into cost of production, or that it is not a factor in price, derives whatever validity it has from the fact that rent is a surplus or unearned income. Unfortunately this idea has been supported by the inconclusive, not to say ludicrous, argument that if rent were remitted it would not affect price. It is, of course, equally true to say that if wages were remitted, prices would remain the same. It all amounts to saying that if those who receive one share in the product of any industry should decide not to take it, those who receive some other share would get it, but it hardly seems worth while to spend time in demolishing such an argument.

There is, however, a sense in which rent does not enter into cost or into price, which can not be affirmed of either wages or interest. This makes a valid distinction between the rent of land and the income derived from the ownership of produced goods. If any one can explain this distinction away, he will have done something which no one has yet succeeded in doing, though many have tried. The three following propositions can be laid down respecting wages. 1. In order that there may be production, there must be labor. 2. In order that there may be labor, men must receive wages as a personal income; otherwise there will be no labor and no production. 3. Therefore, wages as personal income are necessary for production.

Three similar propositions may be made respecting interest. 1. In order that there may be efficient production, there must be waiting. 2. In order that there may be waiting, men must receive interest as a personal income to induce them to wait; otherwise there will be no waiting, or very little of it, and consequently, very inefficient production. 3. Interest, as a personal income, is necessary to secure efficient production.

Now, obviously, no propositions resembling the second and third in either of the above series can be made respecting rent. Since it is not necessary that any one should receive rent as a personal income, in order to secure efficient production, one is warranted in saying that rent does not enter into cost in the same sense that wages and interest do. These shares are necessary parts of the cost of production in the sense that no one could be induced to take part in production unless he were allowed a personal income of one kind or the other, whereas production would be quite as efficient as it now is even if no one were allowed rent as a personal income.

It may be true, and probably is, that from the standpoint of functional distribution pure and simple, there is no good reason for distinguishing between the income derived from the ownership of land and that derived from the ownership of capital. But a theory of functional distribution which does not in some way throw light on the more important question of personal distribution is about as useless a piece of speculation as ever occupied the attention of a mediaeval schoolman. Instead of holding, as the paper before us seems to imply, that economics is concerned wholly with functional distribution, I should hold that economics does not care a fig for functional distribution except as it helps us to

understand personal distribution. The question of personal distribution is a question of the real world, whereas the question of functional distribution is a question of Platonic ideas. From the standpoint of personal distribution there are abundant reasons for distinguishing between the income from land and the income from produced goods. Therefore, as it seems to me, the development of the technical or scientific concept of rent has been a logical one. That is to say, economists have been justified in distinguishing as they have, between incomes from these two sources. It may, however, still be open to question whether the terms, rent and interest, ought to have been used to express this distinction.

On the popular side the concept of rent has undergone a different development. Though doubtless originally applied to the income from the ownership of land, since that was the most important kind of property let for a lump sum, it was soon expanded so as to include the income from the ownership of any kind of property let in a similar way, *i.e.*, where the property is regarded merely as a material thing, rather than as a quantity of wealth.

The name interest, on the other hand, was doubtless originally applied to the income derived from the ownership of money, because that was the most important kind of property loaned for a per cent of the principal. This is possible only when the income and the principal are alike, or where they can be reduced to the same quantitative expression. But this term was gradually extended so as to cover the income from any kind of property when that property was expressed as a sum of value in terms of money, and when the income could

for that reason be expressed as a percentage of that sum, *i.e.*, as a percentage of its source.

The result of the extension of the rent concept in one direction and of the interest concept in the other, is that in popular usage the two concepts have come to overlap, so far as the sources of the two kinds of income are concerned. That is to say, the same income has come to be called either rent or interest, according as the source of the income is measured and expressed as a physical quantity or as a quantity of value.

Since this is the way in which the business world has come to use the terms rent and interest, it is somewhat unfortunate that the technical use of these terms has taken a different line of development. From this standpoint it may have been wise for Professors Clark and Fetter to have returned to the popular usage. I think, however, that it would have been wiser and less confusing if they had recognized that they were distinctly breaking away from scientific or technical usage and adopting the popular concept, instead of trying to show that there was no basis for the scientific or technical distinction.

If I have succeeded in showing that there is still an important distinction between rent on the one hand and the income from other agents of production on the other, and that this distinction is essentially what the older economic writers declared it to be, and if it is also made clear that there is a logical basis for the popular distinction between rent and interest, then this whole discussion is concerned entirely with a question in the use of terms. The question is, should the terms rent and interest have been used to express the distinction with which the economic writers have been most concerned, or should they have invented new terms to express that

distinction, leaving the terms rent and interest to express the popular distinction. It is not to be inferred that a question in terminology is unimportant, but it is well to recognize that it *is* a question in terminology, and not a question as to the difference in the real nature of the two forms of income.

JACOB H. HOLLANDER : Professor Fetter's paper is a notable example of acute analytical power, squandered in the service of what Mr. Bagehot has termed "conjunctural history." Hardly to a less degree than in the previous studies with which he has enriched recent economic discussion, Professor Fetter asserts the past relativity and the present unfitness of the classical concepts of rent and interest. But, now as then, he is not completely exorcised of the vigorous devil with which economic theorists, it appears, have been so long obsessed. His paper undertakes not only (a) to demonstrate the historical relativity and present uselessness of the traditional theories of rent and interest, but also (b) to associate with the old terms novel concepts, unfamiliar he admits, but in harmony, it is claimed with modern industrial conditions.

Upon his critics, accordingly, devolves the task of reviewing three intimately associated but clearly distinguishable queries suggested by his discussion.

1. Are the traditional concepts of rent and interest peculiarly relative to the time, place and condition of their original formulation ?
2. Is there no warrant for the retention of distinct laws of interest and rent in any sense approximating their historic significance ?
3. Are the new meanings which Professor Fetter would attach to these terms legitimate and desirable ?

To the first proposition conditional assent may be given. It has become a commonplace in the history of economic thought that the so-called classical formulae of rent and interest reflect in origin and in content the conditions of economic England of the late eighteenth and early nineteenth centuries. It is perhaps true that the beginning of the theoretical differentiation of rent and interest in English political economy may be traced back to Hume's expression to Adam Smith: "I cannot think that the rent of farms makes any part of the price of produce, but that the price is determined altogether by the quantity and the demand." Certainly James Anderson, writing a few years later, was sensible of one distinctive feature of land as a production good. But at least another generation was to pass before the stirring course of politico-economic affairs in England forced attention to visible contrasts in income derivable from land and from capital respectively. The kernel of the Bullion Controversy was whether the fund-holder should benefit and the agriculturist suffer by a return to the older standard of value. The point at issue in the corn-law dispute was whether the economic policy of England should be shaped in the immediate interest of the landowner or of the capitalist-entrepreneur. This antagonism of interests found theoretical expression in the practically simultaneous but independently conceived studies of Ricardo, West and Malthus—wherein the concepts of rent and interest were sharply distinguished and each connected with an independent, and, indeed, antithetical law of determination. The differential principle of rent promptly entered into and shaped the dominant theory of economic distribution. The system which in 1817 in the preface to his "*Principles of Political Economy and Taxation*" Ricardo modestly her-

added as "many important truths, which can only be discovered after the subject of rent is thoroughly understood"—had become a decade later in Malthus' phrase "the new political economy"—supported by James Hill, Torrens, Tooke and, added McCulloch, perhaps its most enthusiastic disciple,—“by all the best economists in the country.”

The corner-stone of the new structure was the law of diminishing returns. From this law proceeded as easy corollaries, the well known dicta of the classical theory: “rent is not a component part of the price of commodities,” “profits depend on high or low wages,” “rents rise as profits fall.”

Passing now from the first to the second proposition suggested by Professor Fetter's paper, it will be readily admitted that the mere circumstance of historic origin is, of itself, no argument for the present worthlessness of the traditional distinction. The one rigid test to which the older concept must be subjected, with a view to determining its further right to be, is—does land as a factor in modern industrial organization retain, or even possess characteristics distinctive enough to differentiate land from capital as a production good?

Professor Fetter is clearly of the opinion that such a differentiation is not warranted, and that if rent and interest are to be retained as independent terms in economic terminology, it must be in very different senses from that to which we have long been accustomed. His argument and his negative conclusions, although not without original elements of interest and importance, may for the present purpose and in this connection, be identified with the reasoning made familiar to us by the more detailed studies of Professor Clark, Dr. MacFarlane, Mr. Hobson, Dr. Johnson and others:—"The principle

of rent," Professor Clark has written, "may be applied to the concrete products of all artificial capital-goods, and even to those of workmen. In the same inaccurate sense in which it may be said that the rent of land is not an element in price, the rent of tools, etc., and those of men themselves, or interest and wages, are not elements in price. We can repeat, word for word, the argument concerning the rent of land, making it apply to the rent of men or to that of artificial instruments, and it will be as true in the one case as in the other."

To the present writer it appears that the identity here so explicitly stated is superficial rather than sound, and that the occasion for radical departure from the traditional distinction between rent and interest, in any other sense than that which Professor Marshall has made familiar, is plausible rather than real. The fallacy underlying Professor Clark's analogy, and in so far, Professor Fetter's argument, arises, like so many other troublesome misconceptions in recent theoretical discussion, from neglect of the *composite* character of the law of diminishing returns, that is to say, from failure to recognize the identical and parallel co-ordination of the differential quality of land in extensive cultivation with the principle of increasing costs in intensive cultivation.

If to a definite amount of land be applied successive amounts of labor and capital, the increments resulting from such application will be relatively diminishing; or viewed as a question of value, and other things being equal,—the cost of each increment will be relatively increasing. The agriculturist is obliged to content himself with this shrinking measure, because the only alternative open to him in extensive cultivation is recourse to less productive land. As a matter of fact, the

relative advantage of either method is so slight that he does both. In rigid theory, every additional product is derived, in part, from extensive, in part from intensive cultivation. The two margins advance *pari passu*, and even the marginal increment of product is composite, proceeding in part from no-rent land, in part from no-rent uses of land.

Now, if a definite fund of capital were to be utilized in conjunction with successive quanta of land and labor, or if a given amount of labor were to be supplied with successive amounts of capital and land, it is perfectly obvious that results identical with the foregoing would follow. But such a condition never occurs, except abnormally or temporarily, and the conception upon which it is based seems unreal, profitless and at variance with the theory as with the facts of industrial organization. No entrepreneur will acquiesce in the condition of diminishing returns to labor and to capital, as he does with respect to land. He will not for a single moment continue using additional land and labor with a given amount of capital, or additional capital and land with a given amount of labor, after the point of increasing, or at the most, of constant returns has been passed. In such cases he will satisfy the demand for a larger product by applying the additional land-labor in the one case, and capital-land in the other—to *new* capital or labor, respectively, and not to the old. This new capital or labor will be available—and this is the all important fact—in identical quality with that capital or labor in use, and not as in the case of land, only in inferior efficiency.

Narrowing our further discussion to the contrast between capital and land, and speaking only of normal, long-time production, the crux of the whole matter

seems to be that, viewed as potential production goods, that is as factors necessary for the satisfaction of increased demand, land is available only in diminishing efficiency both in intensive and in extensive cultivation, while capital is available in diminishing efficiency with respect to intensive use, but in identical, homogeneous quality with respect to extensive use.

It is not possible within the few minutes here available to pursue further the line of thought which it is hoped in another connection to develop more fully. Perhaps enough has been said however to suggest that, in the judgment of the present writer, the primary assumption upon which the classical distinction between rent and interest rests, is still operative, and that independent categories demand recognition. Our scientific fathers builded wiser than they knew, wiser, perhaps, than modern critics are always inclined to admit.

Finally, the student of economic theory in its historical development can have but little sympathy with Professor Fetter's disposition to use the old terms, rent and interest, as labels for new, even though entirely legitimate concepts. If the old differentiation has ceased in fact, let us mark its demise by interment of the accompanying theoretical terms, and not dislodge new vials of wrath by the adoption of terminology, both at variance with practical usage and with traditional scientific employment.

CHARLES W. MACFARLANE: I shall confine myself to Professor Fetter's contention: that any income may be converted into interest by capitalizing it at the prevailing rate of discount or interest. In this connection Dr. Fetter writes on page 196: "The capital value of a good is the sum of its prospective rents and uses, discounted

at a rate that reflects the prevailing premium on the present. Capitalization, thus viewed, is logically a later stage of the problem of value than is rent; and interest first appears in connection with capitalization."

In formulating this thesis Dr. Fetter has clearly followed the lead of Professor Clark. On page 337 of "The distribution of wealth" the latter declares that:—"rent then is nothing more than interest regarded from another point of view, it is an aggregate of lump sums each of which is the net earnings of some instrument. It is identical in amount with interest and it becomes interest the moment we reduce it to a fraction of the value of the instruments that earn it."

Professor Clark here holds that the income from land may be converted into interest by capitalizing it at the prevailing rate while Dr. Fetter holds that not only the income from land but that the total income from any "good" may be converted into interest by this very simple arithmetic device. That we can by such a device convert any income into the form of interest, or express it as a fraction of the total value of the agent producing this income will hardly be questioned, but this, it seems to me, is quite a different thing from converting such income into interest in fact as well as in form.

Let us return to Dr. Fetter's formulation of this doctrine. The capital value of a good is the sum of its prospective rents and uses discounted at a rate that reflects the prevailing premium on the present, etc.

If he will change this so that it will read,—the capitalized value of a good—I fancy that few of us would take exception to the statement. In a word the capitalized value say of a railroad would undoubtedly include any monopoly advantage it might enjoy through its franchise, but can we as economists say that the capital

value of the road includes any such monopoly surplus. If "capital value" and "capitalized value" are equivalent terms then as we have said the difficulty disappears, but it is hardly fair to Dr. Fetter to assume that he would coin a new compound term when we have an equally apt term in familiar use. What then does he mean by the term "capital value" or in brief what concept of capital can he here have in mind. On page 182 he recognises the great importance of Professor Clark's distinction between "capital goods" and the "social fund of capital." It is therefore fair to ask which of these concepts he has in mind when he talks of the "capital value of a good." That the "good" he here has in mind is Professor Clark's concept of "capital goods" need hardly be urged. If so, then there would seem to be strong ground for thinking that his "capital value" of the good corresponds to Professor Clark's "social fund of capital." If this interpretation is correct then Dr. Fetter's thesis resolves itself into the following:—the share of the social fund of capital embodied in any capital good may be determined by capitalizing its total earnings at the prevailing rate of interest. If this is what Dr. Fetter means, and I submit we are left to guess at his meaning, then Professor Clark's distinction between the two concepts of capital may as well be pigeon-holed for they are here hopelessly confounded with one another. Professor Clark has himself written that all monopoly influences where in the "capital goods," the social fund of capital having neither part or lot in any monopoly surplus. If this is true then why confound confusion and ignore the fundamental economic distinction between monopoly and non-monopoly conditions by calling the monopoly earnings of our hypothetical railroad interest and this on the sole ground that by a

mere arithmetic device we have converted these earnings into the form of interest or expressed them as a fraction of the value of the railroad or "capital good" in question.

Dr. Fetter tells us that the capital value of a good may be obtained by capitalizing its earnings at the prevailing rate of interest. This sounds simple enough but one feels constrained to ask :—What fixes this prevailing rate? Had Dr. Fetter seriously addressed himself to this problem he would have found ample ground for thinking that interest is a non-monopoly surplus. If put to it Dr. Fetter would probably have told us that the prevailing rate is fixed by the marginal productivity of the social fund of capital. He might even have told us that with every increase in its supply this capital would be forced to find employment in less and less productive or profitable industries. But if this is true, then manifestly it is in order to inquire what limits the supply of capital, since this has an important bearing upon its marginal productivity and so upon the prevailing rate of interest. Without undue elaboration it may be answered that this depends on the abstinence or disutility endured not by a Rothschild but by the marginal saver. In brief the prevailing rate of interest is fixed at the point where the marginal productivity or utility of capital is equaled to the abstinence or disutility of the marginal saver. If this is sound then the determination of prevailing rate of interest is a problem in normal or non-monopoly value. From this it follows that the only part of the earnings of any capital good that can be charged up as interest in any sense in which we as economists are justified in using the term, is that part which would be secured under the conditions of free competition. This too should be credited to the social

fund of capital while all surplus above this must be credited to the capital good.

Let us bring this matter to the test of a concrete instance and see if we can re-word the matter in any intelligible way. The cost of production, or if you like the cost of reproduction of certain machines is \$100,000. An entrepreneur purchases them at this price borrowing from a capitalist the \$100,000 with which the purchase is made. The machines yield a net income of \$12,500. In the piping times of an industrial boom when prices are rising and the voice of the promoter is heard in the land the first entrepreneur may be able, on the strength of the above showing, to persuade some one to give \$250,000 for these machines, since that would be their capitalized value at the prevailing rate of five per cent, and it may be that the second entrepreneur borrows the \$250,000 with which to complete the transaction. We have here a very interesting complication for the question is very apt to suggest itself: which of these amounts, the \$100,000 or the \$250,000, is the share of the social fund of capital embodied in these capital goods or machines? As what is much the same question, which of the incomes \$5,000 or \$12,500 is to be credited as the earnings of the social fund of capital? When tried by the test of the amount paid to the capitalist for the use of his money the answer does not seem to be at all clear for while the earning power of the machines has remained the same the amount paid to the capitalist has changed from \$5,000 to \$12,500. Again when tried by the test of the amount that figures in the cost accounts of the entrepreneurs the result is equally unsatisfactory. For while in the first instance the amount entered on the cost side of the entrepreneur's ledger will be \$5,000, the second entrepreneur

would certainly charge up \$12,500 as interest on the cost side of his ledger. How then are we to decide. It seems to me this can only be done by return to Professor Clark's fundamental contention "that all monopoly influences inhere in the concrete machines or 'capital goods.'" In a word the mobile homogeneous or social fund of capital cannot be credited with any share on these monopoly surpluses. If then the cost of reproducing these machines is \$100,000, and the prevailing rate is five per cent, then the capital value of these machines or the share of the social fund of capital embodied in them is represented by \$100,000, and the earnings of this social fund or the interest *per se* is \$5,000. For is it not clear that the \$7,500 earned by these machines in excess of five per cent on the cost of reproducing them is due to some monopoly influence that inheres in the concrete machines or capital goods?

Answer may be made that after all this is only a question of definitions. I may define interest as the earnings of "the social fund of capital." Some one else may define it as the total earnings of "capital goods" capitalized at the prevailing rate, and so long as the some one else is consistent with himself in his use of the term, his position is as tenable as mine. Is this quite true? Interest has long found defenders on the ground that some abstinence or disutility is endured. While this truth has not always been clearly apprehended, it has nevertheless been persistent in our literature, and in the minds of most of us still serves to distinguish interest from those monopoly surpluses for which no economic justification is sought. Now, unless we are prepared to show the utter fallaciousness of this belief, we are not at liberty so to define interest as to

include under it the most offensive of monopoly surpluses.

There is yet another way of exposing the confusion of thought in the paper before us. Professor Clark has contented himself with showing that the rent of land may be converted into interest by this process of capitalization. We have just been following Dr. Fetter in his attempt to show that the income from any capital good, including land, may be so converted. But if this is true then why may not any incomes be converted into interest by the same simple device. Dr. Fetter is at least willing to follow his reasoning to its legitimate conclusion, for he writes on page 196 as follows: As the market expression of the all-pervading premium of present over future, interest may appear in connection with any gratifications whether they be yielded by natural or produced by material or *human*, by durable or perishable agents. Clearly, then, not only rent and profit, but net wages as well may be converted into interest by the simple process of capitalizing them at the prevailing rate. And so it comes about not only that the old distinctions of land, labor, entrepreneur and capital are found to be useless, but with them disappears all distinctions between rent, interest, profits, and wages since all may be converted into interest by a simple arithmetical process. It seems to me we have only to state Dr. Fetter's thesis in this bold way to realize that there must be some serious break in his reasoning.

Personally I cannot but feel that those who are working along this line have been betrayed into a *cul-de-sac*, and that all hope for further progress will depend upon a return to Professor Clark's fundamental distinction between capital goods and the social fund of capital. In

a word, any attempt to secure simplicity of statement by ignoring fundamental economic distinctions can only result, as in Dr. Fetter's paper, in elucidating the whole matter into a hopeless obscurity.

LINDLEY M. KEASBEY: The distinction between rent and interest, as I understand it, rests upon an antecedent distinction between two kinds of income-bearing goods, land and capital. But these terms are misleading; land, in last analysis, is mere area, and capital may be made to include all else, even "the original and indestructible powers of the soil," whatever they may be. The distinction, however, being fundamental, I would suggest we employ new terms. Suppose instead of land we say "generative goods" meaning thereby those goods which possess in themselves inherent powers of increase, or procreative power, if you will. Goods which do not possess such power we might then designate as "productive goods" simply, and understand by this what political economists understood by capital in the old sense.

Under the category of generative goods would come animals and plants, which, when brought into the proper connection with the so-called original and indestructible powers of the soil, yield an increase of animals and plants. Historically,—if a little elliptically speaking,—generative goods would then include domesticated animals and cultivated fields. Now the first characteristic of these generative goods is that they do not diminish in quantity during the productive process, that on the contrary, they put forth a physical increase. Furthermore,—and this is economically of the utmost importance,—since domesticated animals and cultivated fields are normally monopoly goods, and not freely reproduci-

ble by labor alone, their physical increase represents a corresponding increase in value. In this case physical increase and value increase coincide. The patriarchs of old were wont to reckon their wealth in the number of their flocks and herds, the landlords their wealth in the extent of their estates and the produce thereof. Of generative goods it may accordingly be said: when put through the productive process they increase in quantity and in value.

Of productive goods this is not the case. When productively employed they augment value as do the generative goods, but this increase of value is necessarily accompanied by a diminution in quantity. Of productive goods it may therefore be asserted: when put through the productive process they decrease in quantity and increase in value.

It is upon this distinction between generative and productive goods that the distinction between rent and interest really rests. Rent was the term originally employed to designate the income derived from generative goods. It was, as Professor Fetter says, the income of "a special social class," the patriarchs and landlords; it was the income derived from "natural agents," *i. e.*, livestock and land; it was the income from "wealth measured physically," since the physical increase in this case correspond to the increase in value. Later on, with the institution of exchange, the term interest came to be employed to designate the income derived from capital, or, in other words, from productive goods. It was the income of another, a new, "social class," made up of merchants and manufacturers; it was the income derived from "artificial agents," *i. e.*, productive goods, "produced material means of production;" it was the income measured economically in units of value, or in terms of money, simply because there was no other way to meas-

ure it; physically speaking there had been a decrease not an increase.

Hence, historically speaking, rent represents the income from generative goods, interest the income from productive goods. Logically, however, the distinction is not so sharp. True, the income from productive goods can not be expressed in terms of rent for there is no physical increase to measure in physical units representing value. On the other hand, the income from generative goods can perfectly well, nay perhaps better, or at least more conveniently, be expressed in terms of interest than in terms of rent. These generative goods put forth a physical and a value increase and such increase can be measured either in physical units (which then represent value units) or in value units alone, *i. e.*, in terms of money. Since the money expression is coming to be wide spread and is essentially more accurate and more convenient, we note the passing of the old rent concept, as Professor Fetter has said, and the general prevalence of the interest concept. Withal, the old distinction between land, *i. e.*, generative goods; and capital, *i. e.*, productive goods, remains and should be taken account of in all questions of rent and interest.

W. G. LANGWORTHY TAYLOR: With respect to this particular part of the field of distribution, Professor Fetter proposes a triple classification: (1) valuation of goods; (2) rent as payment in kind; (3) interest as exchange of present for future goods at a money valuation. These stages are put forward as chronological and logical. As to (1) it seems to me to belong to a distinct category, that of values. This category does not chronologically precede the others, but runs parallel with them; it itself should be broken up into a series of stages, of which the lowest would be the cost of production period,

the second would be the period of equilibrium of utility with utility in a market, the third would be dominated by "price-determining" monopoly, until, fourthly, with the final disappearance of the element of cost, we may in the dim future come to a standstill with values determined by marginal utility *simpliciter*. The statement that subjective valuation belongs at the bottom of the ladder is the very reverse of the truth.

As to stages (2) and (3), Professor Fetter has been much more happy. Accepting the Clarkian theory that rent and interest are *allotropic* forms in distribution, he suggests that rent belongs to an earlier epoch, while interest characterizes the advanced period and the money (or set-off) economy. This distinction is interesting to me because it allows a "paralleling of this part of distribution with the genetic theory of valuation which I suggested above: rent belongs to an earlier, more materialistic stage of civilization than interest, undoubtedly; while the suggestion as to money is calculated to throw light on the function of money as a generalizer of values and a socializer of economic life. Moreover, such generalization involves a decidedly higher intellectual and moral development of industrial man.

The old definitions of rent are criticised by Professor Fetter because they are partial, depend on social distinctions, and are confined to natural agents; because they deny the principle of cost of production to rent, distinguish rent from interest in a superficial sense, assume the indestructibility of a perpetual bearer, and follow a false theoretical lead which made a narrow technical term out of a broad usage of language.

The discussion arising from these attributes is certainly avoided by the new distinction between rent as the return in kind and interest as the return in money. But

it gives rise to newer and graver questions. I am inclined to admit the Clarkian allotropism; but that is posited on the supposition of a perfectly static society. As to a dynamic society Professor Clark has made no statement about rent, but we may assume that the allotropism would there be destroyed. It would there appear that land, as the scarcer factor, has a monopoly value not due to the calculations of the land-owner, and that while he is receiving a monopoly tribute which, of course, is a part of the market supply, the price is regulated by the produce on the marginal land continually brought into cultivation, so that rent is "price-determined," and that if he sells his land and buys industrials he will have to discount the expected fall of the one in terms of the other.

Evidently the proposed distinction does not take the dynamic movement into account; but tacitly assumes that what is true of the static society holds for the dynamic also.

Professor Fetter condemns the philosophy of Professor Marshall which seeks to trace a continuity between the concrete phenomena of rent and interest. As to this criticism it may be said in the first place that it is itself open to criticism, in that it admits validity in reasoning by contrasts alone, and denies it to reasoning by continuities. However, it is only by the latter method that abstract contrasts can be given life and be practically applied. The philosophy of Marshall has succeeded in this quest beyond parallel. The contention is, however, that there is no such distinction—that land is not monopolized, that it is perfectly mobile, that it involves expenses in every way like those in industry, etc. A very fair case of this sort may be made out so long as you retain the static point of view, but no

further; but Professor Fetter does not claim to confine himself to the static point of view, nor could he if he were to make a definition generally acceptable.

In the second place it may be charged that Professor Fetter, in his classifications (2) and (3) has really stated the very contrasts which Professor Marshall has logically united. The case of land rent remains typical of rent as a specific payment in produce, while Marshall analyzes the concrete conditions under which, step by step, such specific payments become socialized and generalized into a return *per cent* on a standard of value. Of course, Marshall's analysis does not set to itself the Clarkian task of an isolation of the static elements; it includes the dynamic elements in a practical way. And yet Marshall's purpose of reconciling the logical positions that Fetter himself has taken are severely condemned by the latter.

It is to be noted that the use of the term "rent" proposed is novel notwithstanding that it once existed. The Ricardian philosophy has driven it out of the Anglo-Saxon business world except in connection with land and its improvements. Does the scientific public desire a counter revolution?

I quite agree, however, as to the usefulness of the distinction defended by Professor Fetter when confined to its original hypothesis of the static state.

RICHARD T. ELY: I cannot help having the feeling that the Henry George agitation has carried some of our economists too far in their opposition to the Ricardian theory, just as the free silver agitation has pushed some of our economists to an extreme in their efforts to combat it. Economists have wished to take the bottom out from under the advocates of cheap money, and in

consequence in some cases have gone too far in their opposition to the quantity theory of money. It seems to me that even if they have done so unconsciously, some of our economists have allowed themselves to be forced to take an extreme position in opposition to the Ricardian theory of rent in order to remove the scientific foundation upon which Henry George endeavored to construct his theories. Naturally I cannot go into this matter to any length in the few minutes allowed me, but I want to attempt to call attention to a few points.

It is said that business usage makes no distinction between capital and land. Here we have to do with a question of fact. My own opinion is that business usage does make a marked distinction. At any rate I am sure that thoughtful business men do so, and that evidence of this can be found in the real estate columns of our daily press and in the business organs of real estate interest.

I have the feeling also that we have been pushed too far by the critics of the Ricardian phrase, "original indestructible powers of the soil," and that we underestimate the nature-factor in land. Perhaps it would be better to say "inseparable conditions of land." Abundant illustration is afforded of rent due to nature, and in cases which I have in mind, what nature offers may be regarded as original and indestructible. Take for example the land on which peaches are produced in the vicinity of Palisade, some ten miles east of Grand Junction, Col. Some of this land could not be bought now for a thousand dollars an acre. As I understand it, there is an abundance of land to the westward which is the same property so far as soil is concerned, but it has not the situation. If I am correctly informed this land upon which peaches are raised and which is of so high

a value is so situated that there are breezes which keep off the frost at critical periods. We have here an original indestructable gift of nature. Man cannot produce these conditions. Another illustration is afforded by the land on which grapes are produced in the western part of New York state. Lake Erie retards vegetation in the spring by absorbing heat until the danger of frost is passed, and in the fall by giving off heat, keeps away the frost until the grapes ripen. Here we have also an original indestructible gift of nature. The blue grass region of Kentucky would afford an illustration. The valley of the Mississippi, when contrasted with the rocky soil of New Hampshire, likewise affords an illustration of original indestructible properties of land.

The region in Colorado about Greeley affords a good illustration of gifts of nature which result in rent in the Ricardian sense. These are original and indestructible and strictly limited. They have value because they exist in smaller quantities than man desires. In the West we can also see the fact that an abundance of land is in use which pays no rent and which has been brought into use without any remuneration. The public ranges afford an illustration.

Now if there were time I should endeavor to show that the cases which I have cited are not to be regarded as exceptions to a rule, but they are fair illustrations of general principles.

Just one more point. I think Clark gives us a good suggestion concerning land when he speaks about capital as perpetual. Under the proper economic management the value of capital is perpetual. We can say the same thing in regard to the soil, even taking soil in the narrow sense of the term. Under modern agriculture, the fertility of the soil is maintained perpetually, while

at the same time it yields a return. I offer again as an illustration the country about Greeley, Col., where large and profitable crops of alfalfa are raised, which at the same time improve the fertility of the soil and prepare it for other and still more valuable crops.

JAMES EDWARD LEROSSIGNOL: I am glad that Professor Ely has called attention to the value of lands in the arid West, where problems of rent and interest are even more complicated than they are in the humid East. Desert land that cannot be irrigated is comparatively worthless. Land that is capable of economical irrigation has a considerable value before being improved. Land under a good ditch is worth from \$25 to \$1000 an acre.

In most cases there is a large surplus of value over and above the cost of the ditch and other necessary improvements. Frequently, however, the cost of improvement exceeds the value of the improved land, and the so-called rent is only a very low interest on a permanent investment of capital. Sometimes the cost of operating the ditch, or the cost of putting the water upon the land absorbs all the profits of farming, leaving only the barest wages to the farmer or compelling him to abandon the land.

Is it not correct to say that at least two kinds of returns are here involved—interest and profits on the capital invested in the irrigation ditch, and a surplus return of a different character, due to the natural scarcity of land and especially of water, and following the law of rent?

The annual use value of commodities permanently limited in quantity, such as old paintings, rare coins and land, is surely different from the annual use value

of commodities like houses, machinery or clothing, which are more or less freely reproducible. In the latter case we have equalization of profits and the law of interest—in the former a permanent differential following the law of rent.

So long as some goods are reproducible and others not, there must be a difference between interest and rent.

FRANKLIN H. GIDDINGS: There are certain important implications of that analysis of rent and interest put forth by Professor Clark and held in view throughout this discussion, which makes them practically identical quantities; rent being the sum total of differential gains accruing to concrete capital goods, and interest being the same income computed as a percentage on the total value of the same capital goods, conceived as a fund of "pure capital."

In the first place it is necessary to distinguish between an identity of quantities and an identity of categories. Identifying the sum total of rent with the sum total of interest does not identify rent and interest. The conception that we have to deal with is essentially mathematical, and can best be illustrated by the statistical distinction between the "mode" and the "average" of a column of figures. Two columns of wage rates may foot up to the same total. The average rate in each series may be the same, but one total may be made up of a few very high rates and many very low rates, while the other is made up of many medium rates—a difference of "mode." Rent is essentially a mode of income. Interest is essentially an average.

In the second place, identifying the sum total of rent with the sum total of interest does not involve an affir-

mation that rent enters into price if interest does. On the contrary, if interest enters into price rent does not, unless the sum total of cost enters into price twice.

In the third place, identifying the sum total of rent with the sum total of interest does compel us to identify capitalization with the social fund of capital, and we can escape the force of Dr. MacFarlane's criticism only by identifying the sum total of wealth with the sum total of capital. This identification I am convinced we must make if Professor Clark's conception is to be accepted and to stand. We must include in the sum total of capital goods every iota of unconsumed material wealth, taking the ground that whatever can be capitalized is a concrete basis of pure capital. Absolutely every thing that the individual or the community owns and can utilize can be listed as an asset at some figure, however small, and as such, it contributes to the total fund of value, conceivable as pure capital. Either the whole conception which thus makes capital goods and pure capital opposite sides of the same shield must be abandoned, or the distinction between producer's goods and consumer's goods must be discarded.

WINTHROP M. DANIELS: I am inclined to accept without reservation all that the "arch-heretic," Dr. Fetter, has said, but will not attempt to do more than reply to certain of the issues raised by Dr. Carver. The latter broke a lance for the old axiom that rent enters into cost in a different way from wages and interest. Dr. Carver had contended that while wages and interest as personal incomes were necessary to evoke the labor and abstinence necessary for production, rent as a personal income was not necessary to call land into the service of production. This attempt at differentiation,

failed in two points : first, not all the wages now paid, nor all that is now paid in interest, is necessary to evoke the amount of labor and abstinence now undergone. The totality of wage and interest payments is in excess of the amount required as a stimulus to the present amount of labor exerted and abstinence endured. In the second place, without the expectation of rent (in the sense of a return for the use of so-called natural agents) the amount of land that would be furnished by the owners for productive purposes would be less than it now is. Without the expectation of a return called rent, most individuals would be unwilling to undergo the abstinence required to transform land area into economic land, the agent of production. Virtually wages, interest and rent (so-called) are alike in that the expectation of each is necessary to secure the marginal supplies of each respectively. I thoroughly agree with the theoretic identification of land and capital as proposed by Dr. Fetter.

FRANK A. FETTER : All taking part in this discussion have shown their belief that economic theorizing is worth while, and that theories both good and bad are affected by, and in turn affect, practical life. In accordance with this view, the leading proposition of the opening paper that the conventional concepts of rent and interest are illogical and inconsistent, has a corollary that these concepts are unfitted to explain the problems of the business world, and that another conception must be adopted.

To the frank and friendly criticisms offered in this debate, I shall reply as brevity permits. Those taking part in the discussion may be arranged in a continuity classification (the validity of which I fully admit) from those who for regard of traditional theories would over-

look a lack of logic, to those who for regard of logic are willing to adopt new theories. The conservatives are far from harmonious in their beliefs, and by mutual cancellation they have left for consideration only a residuum of argument.¹

The prime contention of the first part of my opening paper is not, as it was assumed by Professor Hollander to be, "the historical relativity of the traditional theories."² That thought is a minor one, and the brief historical paragraphs were given merely as "side lights" on the origin of the errors.³ It would be an easy task to defend and strengthen these historical references had any one of the speakers sought to controvert them at any specific point. Even the critic who first waived the whole opening paper aside as "conjectural history" gave to the historical suggestions "conditional assent."⁴

Prejudgment has, I fear, caused more than one of my critics to shut his eyes to the repeatedly avowed purpose of the paper, which was to show that the traditional concepts are internally inconsistent, illogical, containing several conflicting thoughts, and that they were thus defective even in the days of Ricardo. In recognizing that some practical issues in Ricardo's time served to obscure this lack of logic, the paper had, to be sure, a suggestion of historical relativity. It is admitted by all the speakers that of recent years the emphasis on the various thoughts of these concepts has been shifted; and some would believe that this shift has cured the infirmities in logic. On the contrary I main-

¹ Brevity compels me to confine these closing comments to the criticisms adverse to the opening paper.

² See above, p. 204.

³ See above, pp. 183-4.

⁴ See Hollander, p. 204, 205.

tain that it has aggravated them. Thus, changes in industry and changes of thought have combined to enhance the difficulties *inherent from the first* in the older concepts.

Professor Carver has dissented generally from the negative part of the opening paper, regretting the attempt "to show that there is no basis for the scientific distinction."¹ He would explain the confusion by declaring that there are two clearly distinguishable concepts, the popular and the scientific, which at times contradict and overlap each other. As none of my critics attempted a specific disproof of this portion of my opening argument I may limit myself here to a reassertion that the so-called "scientific concept" is *inconsistent in itself*, that no writer has employed it without shifting thought and untenable conclusions. It is for the reader to determine whether I have not shown that the so-called "practical concept" has been confused with the so-called "scientific concept" in economists' minds. If this is true it follows that some of the supposed contrasts between rent and interest are but the reflection of the unconscious shifting in the subjective attitude of the thinker.

A test is thus afforded for any revision of the concepts; no valid contrast can be drawn between the concepts of rent and interest where there is an unconscious change from one to another of the three conceptions that have been noted. A shifting eclecticism becomes impossible when these different thoughts are clearly recognized. My critics, however, avoid a clear-cut decision, and uphold conceptions uniting two or more discordant elements. It is not easy, therefore, to say on just what

¹ See Carver, p. 203.

ground they take their stand. They defend in the main the attempt to distinguish between land and artificial agents objectively, but their reasons are largely drawn from supposed differences in the relation of the income to price, and yet according to their own statements this distinction is not co-extensive with that of the two objective classes of agents. Moreover, their arguments involve a use of the third distinction,¹ which they are endeavoring to overthrow.

This confusion may be seen in Professor Hollander's contention that the critics of the traditional distinction overlook "the composite character of the law of diminishing returns." He says that the characteristic that suffices to "differentiate land from capital as a productive good" is its diminishing efficiency in extensive cultivation; "while capital is available in identical homogeneous quality with respect to extensive use." Observe the reasoning by which this conclusion is reached.² The assumption, however, that any particular enterpriser, in enlarging his business, is forced to take up poorer land, surely is not warranted. Except in the rare case that the particular enterpriser had been using the one best piece of land, he can hire more land as good as he has, or even better, if he cares to pay the prevailing rental, just as he can hire more and better machines. The thought evidently shifts to the old dynamic and social conception of the growing scarcity of land with increasing population, and from the particular entrepreneur to the personified total population.

There is another shift, for while the physical conception of land is retained, and it is thought of in terms of

¹ See above, p. 193.

² See above, passage beginning "No entrepreneur" and ending "only in inferior efficiency," p. 208.

acres, the particular produced goods called capital, are thought of in terms of a value unit. This creates the illusion that the differential return is peculiar to land, and that the value units of capital are of homogeneous quality. The varying yields of land are looked at in a way that makes them necessarily appear as differentials, and the varying yields of other agents are by reason of the mode of their capital expression, converted from differential incomes into homogeneous capitalized sums. What is this capital but the incomes (or I should call them rents) of productive goods, capitalized at the prevailing rate of interest? A given rent thus corresponds to one unit of capital, a double rent to two units of homogeneous capital, and a free good, or rentless unit, to no capital at all. This capitalization of rents is possible in the case of land also, the price of land being the sum of the anticipated future rents, discounted to their present worth; and the enterpriser can purchase x dollars' worth of land as easily as x dollars' worth of machines, and the units are just as homogeneous in one case as in the other. In fact, both kinds of agents frequently are bought as value units. The word "amount" in the contrast between an amount of land and an amount of capital begs the whole question, for in one case it means units measured by area and differing in yield, in the other it means the homogeneous value expression of differing units. It is impossible to escape these errors if the analysis insisted upon in the opening paper is overlooked.

Professor Carver has maintained¹ that there are abundant reasons for distinguishing between the income from land and the income from produced goods, in that in-

¹ See pp. 200-201.

terest as a personal income is a necessity to insure waiting, and thus is a condition of efficient production. This is retaining the traditional conception of the distinction between the objective classes of goods, while repudiating the traditional reasoning, and while broadening the conception of rent to any surplus or unearned income. The idea of surplus is generally very vague, but under the application of any suggested surplus-test the concept of rent would extend to numberless incomes and fractions of incomes not derived from land, and would fail to include numberless incomes and fractions of incomes that are derived from land in any usable sense of that term. Replies that, to my mind, are conclusive on the principle here involved were given in the course of the discussion.¹ It follows from this surplus conception that any portion of the income derived from produced goods that would have been saved if the rate of interest had been lower, is rent, not interest; and that any natural element of fertility in land that would have been used up except for the factor of waiting, would thereafter yield interest, not rent. Adopting for the moment the terminology of the critic, his challenge may be accepted; the proposition that "men must receive interest as a personal income to induce them [*i.e.*, the marginal abstainers] to wait" and that "interest as a personal income is necessary to secure efficient production," not only can be but must be paralleled by like propositions concerning rent. Men must receive land rent as a personal income to induce them to bring the marginal land into cultivation and to maintain undiminished the supply of productive

¹ See Daniels, p. 226. Dr. Whitaker's remarks to the same effect unfortunately were not obtainable for this report.

qualities. Thus land rent is necessary to secure efficient production continuously from land. The margin in question is not a hair line, it is in practice a zone of wide extent. This fact is the basis of private property in land as broadly and surely as the other fact is the justification of interest. We are not concerned here with the ethical question, but in each of the two cases a social policy is based on the need of maintaining the marginal units of supply, a policy which always appears unjustified when attention is directed only to the surplus cases.¹ It is in conflict with all experience to assume that the actual supply of land would be kept up to its efficiency if rent did not go to some personal agent who made himself responsible for the repairs, the restoration of fertility, and the waiting for the future involved in refraining from "Raubbau," the immediate exploitation of the land. (In some cases, it is true, this agent may be a group of men acting collectively through government, as in the case of any form of public ownership).

As Marshall says: "The greater part of the soil in old countries . . . has in it a large element of capital. Man can turn a barren into a very fertile soil."² To deny first that the supply of land either as extension or fertility has any marginal relation to sacrifice, or is within man's control, and then when this is shown to be an error, to assert that such land is not land, but capital, and that the income from it is not rent, but interest—this is the approved mode of showing the exceptional character of rent. Are the terms land and rent thus to be refined away from any relation to the real

¹ This applies also in answer to the remarks of Professor Ely.

² Marshall, *Principles of economics*, 4th edition, p. 224. He does not draw the conclusion, however, that is here suggested as necessary.

things about which the economist begins to reason, and of which the practical world thinks whenever those terms are used? ¹

Professor Taylor admits that my thesis is valid when confined to static conditions, but he adheres to "the relation-to-cost" concept in discussing dynamic conditions.² In his very suggestive remarks he has not revealed his thought fully enough to make clear the ground of his reasoning, but it would appear to be essentially the one just examined. While Taylor and Carver differ in some points, they agree in others, both alike rejecting the static reasoning on which Hollander bases his conclusion.

Dr. MacFarlane also holds a relation-to-cost concept of rent, but most of his discussion is given to a negative criticism of my position. His own views, though known to many readers, were not developed in this symposium. Some points will be noted below.

The attacks on my positive proposals refer in part to their supposed implications and consequences, in part to the advisability of the terms suggested.

1. Professor Taylor objects³ that the first of the three stages in the analysis of value is not fundamental and precedent to the others, but is co-extensive with them. This criticism probably proceeds from a misunderstanding of the briefly expressed proposition. Not all goods, but only *immediately enjoyable* goods were said to present the first problem in the analysis of value. The second problem, that of the value of usufructs, and the third,

¹ The interesting facts cited by Professor LeRossignol, p. 224, seem to me to illustrate, not to disprove, the view I have taken, which is far from a denial of the "surplus return" to the investor in land, or in other wealth, in a new country.

² See Taylor, p. 221.

³ See Taylor, p. 218.

that of the value of future uses, are, as my critic suggests, but developed phases of the general problem of value.

2. Professor Taylor believes that in criticizing Marshall's attempt to trace a continuity between rent and interest, I have denied the validity of reasoning by continuities.¹ It is not to a true continuity concept that I object, but to a pseudo-continuity concept. As the thought passes along the series from rent as an income yielded by one kind of concrete goods, to interest as the income yielded by another kind, there is unconsciously introduced a new contrast. The value expression of capital and the percentage expression of interest are equally applicable to the rent end of the series, and it is an error to assume that they are applicable only at the other end. My suggestion is to apply consistently each distinction in turn.

3. Dr. MacFarlane declares² that the outcome of my proposal is the obliteration of all distinctions between rent, interest, profit and wages. This conclusion, drawn from my statement that "interest may appear in connection with any gratification," is due to the failure to apprehend how and how far the proposed conception differs from the one apparently taken in this discussion³ by the critic himself, that each kind of income corresponds to a particular kind of income bearer. The proposal is to look upon interest in all cases (as it is now in many cases) as being that particular phase of value connected with differences in the time of accrual of incomes. Recognizing that a day's work to-day is worth more

¹ See Taylor, p. 220.

² See p. 215.

³ As is well known to students of economic theory Dr. MacFarlane has in his work "Value and distribution," obliterated the distinctions between the objective classes of agents yielding rents, and other incomes, more fully than has any other writer.

than one next year, does not identify interest and wages. Wages payable at different points of time vary in value as do rents at different points of time, and the comparison of each series is expressed by the interest rate.

4. Dr. MacFarlane objects¹ further that the proposed view of capital identifies the capitalized value of monopoly surplus with capital in general. True it does; there is no other logical way.² It is not quite clear what monopoly means as the critic uses the term, but any source of income that is continuing and foreseeable can be capitalized and sold, and thus becomes homogeneous with the value of the continued control of other sources of income. When from any cause income ceases, the capitalization collapses, monopoly or no monopoly. The puzzle as to whether the \$5,000 or the \$12,000 are to be called interest, is merely a confusion of the problems of economic income and contract interest.

5. Dr. MacFarlane says³ that I have tried to identify land and capital by a mere arithmetic device that does not touch the substantial differences. I would reply that because an arithmetic device has been inconsistently applied in the traditional theory, illusive contrasts not existing objectively, have been created. I dissent from Professor Carver's opinion that it is merely a question of terminology in dispute,⁴ and I agree with Dr. MacFarlane that there is involved more than a question of definition.⁵ The arithmetic device is significant at least in a negative criticism of the supposed contrast between rent as a differential and interest as a homogeneous income; it serves to show the fallacy in the old view as to the spe-

¹ See pp. 213-14.

² See Professor Gidding's reply, p. 226.

³ See p. 212.

⁴ See p. 203-4.

⁵ See p. 214.

cial relation of rent to entrepreneur's cost of production ; and it sets in a clear light the error in the traditional contrast between the value expression of "capital" and the concrete expression of land. This proof of the substantial unity and continuity of the body of income yielding wealth has been suggestively styled by Professor Taylor¹ in a phrase drawn from chemistry, "allotropism." One group of elements has been mistaken under differing conditions for two elements, (the condition in this case being the subjective attitude of the thinker). Take away the fallacious contrast, apply the arithmetic device consistently, and the objective classes of "natural agents" and "capital goods" are seen to be merged into one body of wealth, presenting three value aspects : gratifications, usufructs, expectations. But identifying the substance does not identify the allotropic states ; coal is not diamond, though both are allotropic states of carbon ; and no more is rent the same as interest. Like most analogies, however, this one is not perfect, and may become misleading. But this has brought us to another question deserving special answer.

6. It is taken for granted that my proposition is to treat rent and interest as identical. Several of the speakers have assumed that the idea of the paper was that of John B. Clark, and thereupon they have criticized his views, not mine. My indebtedness (shared in common with all contemporary students) to the inspiration of this ablest of theoretical economists, should not impose on him any responsibility for the theory of distribution here presented. The prepossessions of some of the speakers make it difficult for them to see the full import of a denial of the parallelism between the two incomes, rent and interest on the one hand, and the two objective

¹ See p. 219.

classes of goods, land and capital on the other. They therefore attribute to me conclusions deduced from premises of their own supplying. This is seen in the assumption that a denial of the conventional contrasts between valuable natural agents and (conventional) capital is a denial of the difference between rent and interest. It is consistent with my view to speak, as Professor Daniels does, of the identification (or merging), of the classes of wealth composing "land and capital" (in the conventional sense); but this is not an identification, as others consider it to be, of rent and interest. Having made this point as clear as I could in the limited space allotted, I can merely re-assert that this lack of parallelism is of the very essence of the contention in the opening paper.

7. Finally, it is said¹ that if the old concepts are to be rejected, it is better to devise new terms than to adapt old ones having misleading associations. To this view must be conceded a large measure of validity. Regarding the term rent there is less difficulty, as the broad meaning here suggested not only has strong historical support, but in many languages, including our own, is grounded so deeply in popular usage that no economic authority has been able to uproot it. There is needed only an elimination of inconsistent thoughts from the concept and the retention of one of the ideas that always has been present in it. Regarding interest the decision is more difficult. Only yesterday economists talked of "the theory of profits" when they meant what is now called "the theory of interest." The term interest, until recently, was used almost if not quite exclusively, as meaning the income from a money loan. This is a contractual, not an economic income, and as

¹ Hollander, p. 209.

such is not a genus coördinate with economic rent, rather it is species of the genus contractual rent. Is it not significant that even in the classical treatment interest as an accruing or realized income expressed as a percentage never appears except as the result of a contract?

The essence of the so-called problem of interest, according to the view in the opening paper is not fundamentally contractual interest, but capitalization. The problem logically following that of rent is not that of analyzing a coördinate income, for rent absorbs all the incomes accruing from material agents at any moment of time; but it is that of the value-calculation on future incomes. The title of the opening paper might perhaps better be: "The relations between rent and capitalization." That, however, would have misled the reader approaching it with the older conceptions in mind. Either "the theory of discount" or "the theory of capitalization" would be a more appropriate term for this part of the problem than is the theory of interest, and possibly some still better term can be found. The final use of terms is a matter of social convention; but when the real nature of the problem is understood, and then the fitting terms are suggested, they will not long fail of acceptance, as the example of the rapid change in the usage of the word profits gives reason to hope.

Whatever other impression may be left by this discussion I trust it will not be that I have contended for a merely verbal change. On the contrary I have outlined, whatever be its defects, a radically new conception of the whole theoretical analysis of distribution. Doubtless this session has been most profitably spent in considering the more negative phases of the subject; but

the scant attention that has been given to the yet more important positive outcome of the study may leave an impression of negation and verbal criticism that is misleading.

I welcome the able, forcible and somewhat unexpected support that has been given to my thesis in this discussion by the advocates of a realistic theory.¹ Opinion on this subject is unquestionably in process of change. Even the more conservative speakers in this session have made concessions that would have been startling a few years ago. The immediate result of such a friendly interchange of views as this has been, may be to strengthen each in his own opinion; but in the end the result must be to help us all towards the right solution of these difficult and important problems in the realm of abstract economic theory.

¹ Daniels, Giddings, Marburg, Whitaker. Unfortunately no report was secured of Mr. Marburg's brief and pointed remarks or of Dr. Whitaker's subtle discussion. Professor Keasbey's attitude toward the question is favorable to the opening paper as against its critics, but his point of view is original, and his treatment in several ways not consistent with the views I have expressed.

INDEX

- Adams, Henry C., 60.
 Address of welcome on "The value of Southern idealism," by Edwin A. Alderman, 74.
 Agriculture, negro's effect on, 122; progress of Southern, 119; recent development of Southern, 125.
 Agricultural outlook, general Southern, 119.
 American Economic Association, general, 1-2; constitution, 3; objects, 3; membership, 1-3; honorary members, 3; officers, 4; council, 4; by-laws, 5; meetings, 1; publications, 1.
 Alderman, Edwin A., address of welcome on "The value of Southern idealism," 74.
 Anderson, James, 205.
 Artificial agents, 180.
 Bagehot, Walter, 204.
 Balfour, A. J., 54.
 Barter, 51.
 Barter economy, 194.
 Beet sugar, 97.
 Böhm-Bawerk, 176, 188, 189, 195.
 Boll weevil, 113, 159; damage caused by, 115; habits of, 114; progress of, in Texas, 114; prospects for overcoming, 110, 117. See *map*.
 Breaux, S. Locke, discussion on "Rice," 110.
 Bullock, C. J., 179.
 By-laws of Amer. Econ. Ass'n., 5.
 Cairnes, 54.
 Canard, 65.
 Cane sugar, introduction of, 81.
 Cannan, Edwin, 62.
 Capital aspect, 193-5.
 Capital, social fund of, 214.
 Capital value, 210-212.
 Capital and land, business man's distinction between, 222-224.
 Capital goods, 182, 211, 214, 226, 237.
 Capitalization, 196, 197, 209, 210, 226, 239.
 Carnegie Institute, 45.
 Carlyle, 57, 58.
 Carver, Thomas N., discussion, 199; 226, 229, 231, 234, 236.
 Civil war, effect on cotton industry, 146; sugar industry, 81, 99; effect on Southern industry, 163; South's slow recovery from, 121.
 Clarification of sugar, 89.
 Clark, John B., 182, 191, 203, 206, 207, 210, 211, 215, 219, 220, 226, 237.
 Climate, effect on tobacco, 136.
 Committees, standing, 6, 43.
 Constitution of the Amer. Econ. Assn., 3.
 Cost of production, 180, 190, 192, 200, 218, 219; relation to rent and interest, 180, 234.
 Cost, marginal, 53.
 Cotton, boll weevil; future of, 126, 160; history of in U.S., 144; see *boll weevil*.
 "Cotton and the general agricultural outlook," paper on by D. F. Houston, 113-122; discussion by Geo. K. Holmes, 122; William C. Stubbs, 128.
 Cotton gin, 149, 150, 152; effect of, 162.
 "Cotton industry," paper on by D. A. Tompkins, 144; discussion by C. C. Thach, 154.
 Cotton industry, effect of Civil war, 146; importance to South, 154; manufactures in South, 159; present situation of, 150.
 Cotton production, outside boll weevil district, 117; effect of slave labor on, 148; and price by years since 1790 (table), 147.
 Cotton seed, utilization of, 164; value of products of, 158.
 Council meeting, 41; members of, 8-11; recommendations of Executive Committee, 42.
 Cultivation of sugar, 86.
 Daniels, W. M., discussion, 226; 232, 238, 240.
 Definition, incompleteness of definition of rent and interest, 177.
 Diffusion, extraction of sugar juice by, 88.
 Diminishing returns, 206-8, 230.
 Distinctions between rent and in-

- terest by class ownership 178, 187;
by natural and artificial agents,
180; incapable of application 193,
still to be maintained, 209, 235,
238; by relation to cost, 180, 190,
200, 212; by physical or value
expression of agents, the wealth
and capital aspects of goods, 181,
193-6; useful when confined to
static state, 221, 234; conflicting
distinctions, 185, 186; by genera-
tive and productive goods, 216;
237.
- Distribution, outlines of Fetter's
theory, stated, 196; functional,
201; system presented by Mac-
Farlane, 192.
- Domestic trade, 54, 55.
- Durham, city of, 143.
- Durable goods, 193, 194, 215.
- Durability of rent and interest
bearers, 182.
- Dymond, John, discussion on
"Sugar," 99.
- Eastern markets, importance to
cotton producer and to South,
152.
- Economic Association. See Amer-
ican Economic Association.
- Economic history, 183, 184, 194.
- Edmonds, Richard H., paper on
"Utilization of Southern
wastes," 162.
- Ely, R. T., discussion, 221; 233.
- Emigration from South, 148.
- Ethics, 50.
- Exchange, 51.
- Fertilizers, use of, in South, 158.
- Fetter, Frank A., Secretary's re-
port, 41; treasurer's report, 44;
paper on "Rent and Interest,"
176-198; discussion, 227-240.
- Finance, public. See *Taxation*.
- Fisher, Irving, 176.
- Forestry, movement toward scien-
tific, 168.
- Generative goods, 216-8.
- George, Henry, 221, 222.
- Giddings, F. H., discussion, 225;
236, 240.
- Glasson, William H., discussion
on "Tobacco," 142.
- Graining sugar, 90.
- Granulation of sugar, 91.
- Held, Adolph, 179.
- Hill, 206.
- Historical condition as occasion-
ing the original confusion as to
the nature of rent and interest,
183, 228.
- History of cotton industry in U.
S., 144.
- Hobson, John A., 191, 192, 206.
- Hollander, J. H., discussion, 204;
228, 230, 234.
- Holmes, Geo. K., discussion on
"Cotton and the general agri-
cultural outlook," 122.
- Houston, D. F., paper on "Cotton
and the general agricultural
outlook," 113.
- Hume, 205.
- Improved agents, 179, 180.
- Incidence of taxation, 63, 65-8.
- Indestructible powers, 222, 223.
- Industrialism, Southern, 75.
- Inhabitants, South's need of, 175.
- International trade, 54, 55.
- Interest, as an average, 225; con-
tract, 183, 184, 185; imperfect
definition, 177; a percentage,
184, 186, 202, 203; propositions
concerning, 201; rate, how fixed,
212.
- Johnson, Alvin S., 178, 206.
- Juice, extraction of sugar, 87; by
pressure, 87; by diffusion, 88.
- Killebrew, J. B., discussion on
"Tobacco," 135.
- Knap, S. A., paper on "Rice,"
102.
- Keasbey, Lindley M., discussion,
216; 240.
- Labor, 57.
- Labor, deterioration of negro, 123.
- Land and capital, distinction in
business said to be impossible,
189; said to be made, 222-4.
- LeRossignol, J. E., discussion, 224;
234.
- Lumbering, 166.
- MacFarlane, C. W., discussion,
209; 192, 206, 226, 234, 236.
- Malthus, R., 180, 205.
- Map showing boll weevil district
in Texas, 115.
- Marburg, Theodore, 240.
- Marginal utility, 219.
- Marshall, Alfred, 176, 179, 181, 190,
207, 220, 233, 235.
- McCulloch, J. R., 62, 206.
- Meeting, sixteenth annual, 38.
- Members, list of, 12-36; summa-
ries of, 37; changes in, 43.
- Migrations of negro, 123.
- Mill, J. S., 54.

- Milling of rice, 106.
 Mississippi River, attempts to check overflows of, 85.
 Mississippi River Commission, 85.
 Molasses, 91, 92; mixing and bleaching, 96; from open kettle factories, 93; how different from syrup, 94.
 Money economy, 194.
 Monopoly, price determining, 219.
 Natural agents, 180, 188, 190; 237.
 Negro, 76; effect on Southern agriculture, 122.
 Negro labor, 123, 157, 160; migrations to city, 123.
 Officers, election of, 46; for year 1904, 7.
 Open kettle factories, 92.
 Packing industry, 165.
 Packing sugar, 95.
 Perique tobacco, 140.
 Perishable agents, 215.
 Positive solution of the theoretical problem of rent and interest, 193.
 Popular concept of rent, 202, 203.
 Preparation of rice for food, 107.
 Pressure, extraction of sugar juice by, 87.
 Presidential Address, on "Social aspects of economic law," by Edwin R. A. Seligman, 49.
 Produced agents, 188.
 Productive goods, 216, 217, 218.
 Progress, in South, 170; of Southern agriculture, 119.
 Program, 38.
 Property, private, 55, 56, 57.
 Quasi-rents, 181.
 Racial integrity, 76.
 Railroads, effect on South, 124.
 Recommendations of Executive Committee to Council, 42.
 Rent and interest not to be distinguished by difference in agents yielding, 194; as successive stages in the analysis of value, 195; relativity of concept, 205; see *distinctions*.
 Rent, an absolute amount, 184, 186; imperfect definitions, 177; development of "popular concept," 202, 203; development of "technical concept," 199-202, 203, 229; contract, 183, 184, 185; a "mode," 225; return in kind, 219; summary of essentials of, 185, 186.
 Reproducible goods, 225.
 Resolution, 47.
 Retrogression in the South, 171.
 Ricardo, David, 54, 64, 179, 180, 183, 184, 189, 196, 205, 222, 228.
 "Rice," paper on, by S. A. Knapp, 102; discussion by S. Locke Breaux, 110.
 Rice, economic production of, 107; errors of preparation and distribution, 106; future of, 112; as a human force, 105; industry, present status of, 102; sale of, 108; injury through system of toll milling, 110; remedy for system toll milling, 111; a future staple crop, 103; time and labor necessary to produce, 107.
 Secretary, report for 1903, 41.
 Seligman, Edwin R. A., Presidential address on "Social aspects of economic law," 49.
 Sheller, Lawson H., paper on "Tobacco," 129.
 Single tax, 190.
 "Sirop de batterie," 94.
 Smith, Adam, 55; his principle of economic progress, 51; 64, 179, 180, 205.
 Slave labor, 153; advantage to South, 155; effect on cotton production, 148; efficiency of, 155, 156.
 "Social aspects of economic law," presidential address by Edwin R. A. Seligman, 49.
 Social class, 178, 185, 187.
 Social fund of capital, 226.
 Soil, effect on tobacco, 139, 140.
 Solution of the inconsistencies between rent and interest, 187, 188, 190-2, 193, 194, 195, 219.
 String sugars, 92.
 Stubbs, William C., paper on "Sugar," 79; discussion on "Cotton and the general agricultural outlook," 128.
 "Sugar," paper on, by William C. Stubbs, 79; discussion by John Dymond, 99.
 Sugar, clarification of, 89; cultivation of, 86; grades of, 94, 95; graining, 90; granulation, 91; obstacles to production, 84; output, 84; how packed, 95; preparation of grounds for, 86; time of planting, 87; influence of tariff on, 85; extraction of juice, see *juice*.
 Sugar beets, extraction of juice, 88.

- Sugar cane, 86; propagation of, 86; prospects, 96; seedlings, 83.
- Sugar industry after the Civil war, 99; influence of Civil war on, 81; development of, 79.
- Syrup, how different from molasses, 94.
- Table, showing production and price of cotton since 1790, 147.
- Tariff, influence on sugar industry, 85.
- Taxation, 58-70; absorption theory, 66; conclusions, 70, 72; justice in, 61; personal property, 67-8; shifting and incidence, 63, 65, 66.
- Taxes, on real and personal property, 68.
- Taylor, W. G. L., discussion, 218; 234, 235, 237.
- Technical concept of rent, 199-202, 229.
- Textile schools, 159.
- Thach, C. C., discussion on "Cotton Industry," 154.
- Time, as the basis of distinction between rent and interest, 196.
- "Tobacco," paper on by Lawson H. Shelfer, 129; discussion by J. B. Killebrew, 135; William H. Glasson, 142.
- Tobacco, climate's effect on, 130, 136; commercial values, 135; handling, 132; Perique, 140; soil's effect on, 136, 139, 140; species of, 135; taxes on, 142; theory of growing yellow tobacco, 137; variability of species, 136; yellow variety, 136; white burley variety, 138.
- Tooke, 206.
- Toll milling of rice, 110; remedy for evils of, 111.
- Tompkins, D. A., paper on the "Cotton Industry," 144.
- Torrens, 206.
- Treasurer's report, 44.
- Turgot, 57.
- Turpentine, 167.
- Utility, 219; marginal, 53, 54.
- "Utilization of Southern wastes," paper on, by Richard H. Edmonds, 162.
- Value, 53.
- Wages, necessary to induce labor, 200; not so in some cases, 226, 227.
- Walker, F. A., 179.
- Wastes, utilization of Southern, 162.
- Water power, utilization of, 169.
- Wealth aspect, 193, 194, 195.
- West, 205.
- Whitaker, A. C., 232, 240.
- White burley tobacco, 138.
- White labor, supplementing negro labor in cotton fields, 124; change from negro to, 157.
- Yellow tobacco, 136; theory of growing, 137.

